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ABSTRACT

This International Reading Association publication presents a view of the problems of reading in the content fields as they relate to the secondary school curriculum. The first part deals with the beginning and the growth of a comprehensive reading program at the University of Chicago Laboratory School. Eleven of the school's faculty provide insights into how a teacher in his own content area can upgrade his students' reading. An administrator and reading consultant at the same school relate how they support a school-wide reading effort. Papers composing the first part were all presented at a special institute at the 1969 International Reading Association Convention. Part 2 includes papers presented at other times during the convention but which were related to the general theme and which were in favor of a reading program as "part and parcel" of the content learning program. References are included with many of the individual articles. (This document previously announced as ED 036 399.) (NH)

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FUSING READING SKILLS AND CONTENT

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Foreword

FUSING READING SKILLS AND CONTENT is a significant addition to the International Reading Association's publication list.

Some years ago the Committee on Reading of the National Society for the Study of Education observed that "the greatest opportunity for progress in teaching reading . . . lies in an intelligent attack on the problems of reading in the content fields." This volume represents an intelligent attack upon those problems as they relate to the secondary school curriculum. As the editors point out in their introduction, this volume is more than the gathering of papers presented at a conference. The major part of the volume represents the work of the faculty of the University of Chicago Laboratory School as it was presented at a Preconvention Institute at Kansas City. The second part of the volume includes selected papers presented elsewhere on IRA's Kansas City Convention program.

Special thanks are extended to H. Alan Robinson and Ellen Lamar Thomas who planned and directed the Preconvention Institute and who made the necessary arrangements for the University of Chicago Laboratory School faculty to participate. The diligence of their efforts is reflected in the quality of this volume.

Leo Fay, *President*
International Reading Association
1968-1969

The International Reading Association attempts, through its publications, to provide a forum for a wide spectrum of opinion on reading. This policy permits divergent viewpoints without assuming the endorsement of the Association.

Introduction

THE PUBLICATION OF *Fusing Reading Skills and Content* is a dream come true for the editors. We have long wanted to present to reading specialists the view of a reading program which truly permeates a high school curriculum. The reader cannot help realizing, as he peruses each of the papers in this volume, that the process of reading is an integral part of the learning which takes place in each content area.

Fusing Reading Skills and Content is organized into two parts. Part One contains the presentations of a high school faculty almost exactly as given at the 1969 International Reading Association Convention in Kansas City. These presentations were planned as a preconvention institute called "Reading in the Secondary School Curriculum." On Tuesday, April 29, papers were delivered by noted reading authorities who were not members of the high school staff but who, as part of the preconvention institute, laid the groundwork for the next day's session conducted by the high school staff. The next day, thirteen members of a high school staff talked about their reading program as it exists at the University of Chicago Laboratory High School.

The presentation by the university high school delegation at the Kansas City convention was unique in the annals of IRA conventions. Reading specialists viewed, in the flesh, classroom teachers and other staff members who are active and skillful in helping all students, not only retarded readers, move closer to their full potential. As someone put it, "At University High, reading is taught in English class, over the cookstove in home economics, and even on the basketball court." In Part One, each of eleven teachers shares insights on how a teacher in his own content area can upgrade his students' reading, and an administrator and a reading consultant talk about how they support a school wide reading effort.

Part Two consists of some very interesting papers, related to the general theme of this publication, which were delivered at various other times during the IRA convention in Kansas City. Together with the message in Part One, these papers raise a powerful voice in favor of a reading program that is part and parcel of the content learning program.

There are many people to thank for the contributions to this volume. Certainly the reading authorities who spoke during the first day of the preconvention institute and those who presented papers during the convention at large focus on significant ideas, both conceptual and pragmatic, which will be of great interest to the reader. We are indebted to these specialists for their assistance. But most of all, we owe a great deal to the faculty members of the University of Chicago Laboratory High School who claim not to be reading specialists but who certainly are sold on a reading program. They worked for many months on organizing their presentations and took time off from their busy schedules to come to Kansas City to participate in the preconvention institute. Most of all, we are obligated to them for the exceptionally pragmatic activities and suggestions that they put before us as they spoke about reading within each of their own content areas.

The purpose of this volume is persuasive. The authors hope to encourage all high school classroom teachers and reading specialists to consider or reconsider their reading programs and place the focus on the fusion of reading skills with the content of each discipline.

H. A. R.
E. L. T.

PART ONE

Reading Skills Common to the Content Areas

OLIVE S. NILES
Springfield, Massachusetts, Public Schools

IT IS THE FIRST PERIOD in the morning. In his social studies class Student X is reading several pages from his history book, containing paragraphs such as the following:

> Even more dangerous than the continuing crisis over Berlin was

> "Yankee imperialism."
>
> (Boyd C. Shafer et al, *United States History for High School.* Laidlaw, 1966, 663.)

Fifty minutes later, Student X may be reading this paragraph from a biology text:

> Since euglenas possess some characteristics of plants and some of animals, they have been claimed by both botanists and zoologists. Because of one of their methods of locomotion, they are often placed in the protist phylum *Mastogophora* (mass-ti-GAH-fuh-ruh), although some biologists put them in a phylum of their own. The organism swims by means of a flagellum attached to the anterior end. The flagellum—nearly as long as the one-celled body—rotates, thus pulling the organism rapidly through the water.

> (James H. Otto and Albert Towle, *Modern Biology*. Holt, Rinehart and Winston, 1969, 257.)

In English class, a little later, we might find Student X interpreting this poem:

> ### REFUGEE IN NEW ENGLAND
>
> Across the snow the water-color blue
>
> The young boy wept, his cheek against cold ground.
>
> (Frances Frost, "Refugee in New England," in G. H. Clarke Editor, *The New Treasury of War Poetry*. Houghton Mifflin, 1943.)

In his math class, Student X may read this problem:

> An airmail parcel may weigh from 8 ounces up to 70 pounds, but the sum of the length and girth may be no more than 100 inches. What are the dimensions (length, width, height) of the longest acceptable airmail parcel, in the shape of a rectangular solid, that is twice as long as it is wide and that is two inches higher than it is wide?
>
> (Mary P. Dolciani et al, *Modern School Mathematics, Algebra* 1. Houghton Mifflin, 1967, 125.)

We might continue to follow Student X to other classes, perhaps industrial arts, music, a foreign language, or some business subject. Everywhere he goes, all day long, day after day, much of his success depends on his ability to read material similar to the samples cited. Secondary teachers know this fact well; but, because they are all specialists, usually in just one subject area, they often forget the concomitant fact that Student X has to shift gears in his reading again and again as he moves during the day from one subject area to another. Admittedly, it is unfair to take brief excerpts out of context as samples. Discount, if you will, fifty percent of the difficulty that would seem inherent in these samples. Of course, it is a great deal easier to read them if you have read and understood what preceded them, but it is still apparent that Student X is confronted with a situation which challenges a good reader and is perhaps downright impossible for a poor reader.

We can make the situation somewhat less threatening if, as a group of teachers, we can see the elements which are common to the study of all these kinds of materials and if we can help Student X to understand that there are important similarities as well as differences between a method of study appropriate, for example, to reading the poem and a corresponding method of study appropriate to solving the algebra problem.

In order to analyze the common elements present in reading, even of materials as diverse as those represented in the samples, I have taken two approaches to the task. The first of these involves analysis of the act of reading itself; the second, analysis of basic skills and abilities needed to handle any and all types of reading material.

The Act of Reading

Definitions presented by various authorities range from a simple equating of reading with the decoding process to definitions which are extremely broad and include skills which probably have more to do with thinking in general than with reacting to print alone. These various definitions are not necessarily contradictory; they differ in scope rather than in meaning. For the purposes of this paper, I am using a broad definition which includes 1) recognition of, 2) reaction to, and 3) use of the meaning behind printed symbols. The broad definition is necessary in defining the role of reading in the content areas.

The reading act, according to this broad definition, may be subdivided into six large, interdependent parts: word recognition, association of meaning with individual printed symbols, literal comprehension, interpretation, evaluation, and assimilation. Each of these basic parts of the reading act is present in some degree in the reading required in any of the content areas. Differences lie in the ways in which the parts are used in handling differing materials and in the degree of importance each has in a given subject.

Word recognition

No reading in any subject can take place without word recognition. By this term we mean the ability to translate, orally or subvocally, the written symbol into a spoken symbol. Many secondary students have mastered this skill and most of them have a fair command of it. Except for the very poorest readers, the secondary teacher may assume a knowledge of the four kinds of clues the mature reader uses to identify words which are not a part of his instant recognition vocabulary: context clues, phonetic clues, structural clues, and—as a court of last resort—the dictionary with its diacritical markings. However, most secondary students need consistent review of the principles and procedures necessary for ease in word recognition because what has been learned in the elementary school about recognizing words has not yet become an automatic process. Problems with word recognition may occur in any subject field; they probably occur most often in science, where a concentration of new words with unknown pronunciations often appears. In the paragraph about euglenas there are five or six words which might give many students pause in their reading.

The polysyllabic words in the English language can all be classified in one of four groups as follows:

1. Words which are compounds—officeholder, carpetbagger, radioisotope.
2. Words which should be attacked by structure because they are English root words with affixes—hyperthyroidism, reforestation, suburbanization.

3. Words which must be attacked by dividing them into syllables—corollary, mutation, alliteration.
4. Words which are so irregular as to require the use of a dictionary (mostly proper names and foreign words)—habeas corpus, ichneumon, quaestor, Gounod.

Quick recognition, usually unconscious, of the pronunciation grouping to which a word belongs triggers, for the mature reader, the procedure he needs for quick, easy pronunciation.

Association of meaning with printed symbols

Association of meaning with the printed symbol is the second part of the act of reading. The student may pronounce *phylum* very readily if he is familiar with a few phonetic principles, but the word may be just a mouthful of sound. If the concept is not already there, the symbol is useless. There is no essential difference between reading the usual verbal symbol (the word) and reading such nonverbal symbols as $<$ or H_2SO_4. The mathematical or scientific symbol often stands for a complex relationship, but it may be no more difficult to understand than such very abstract verbal symbols as *imperialism* or *irony*.

A major responsibility of all content teachers is to develop many new concepts with which printed symbols may be associated. This is a very different emphasis in vocabulary teaching from that of the elementary school and is one of the strongest reasons why the teaching of reading has to continue in the secondary school. The little child comes to school with many words in his aural-oral vocabulary and few, if any, in his reading vocabulary. During his elementary school days his energies are directed mainly toward learning to read words which are already in his aural-oral vocabulary. By the time he is in secondary school, he has probably succeeded in completing most of this task. The emphasis then shifts to developing new meanings. This is a natural and fruitful area in the teaching of reading for all content teachers since each time a new word is taught, a new concept has been taught. Hence, there is a total melding of the teaching of reading and the teaching of content—they are actually one and the same thing.

Some of the concepts behind the words used in content areas are highly generalized. A word like *approximation* is useful in mathematics, English, and social studies—in fact, a student may meet it almost anywhere. Other words have both generalized and highly technical meanings; an example is *rational,* which, in addition to its common meaning, has a very precise technical meaning in mathematics. Still others, like *parabola,* have technical meanings only, often specific to one particular area of study. Responsibility for teaching all three types of words as students encounter them must be shared among all teachers. It is a particularly important responsibility because accurate communication cannot take place unless the author and the reader have a common understanding of the concept behind each symbol. A very simple example is the word *girth* in the algebra problem cited earlier. Unless the student knows exactly what concept this word triggers, he cannot do the problem.

Literal comprehension

Literal comprehension is also clearly a part of the reading act and must be stressed in every content area. It involves some very important subskills, such as reading for central ideas and noting the way details are organized around these central ideas. Solving the algebra problem, for example, requires that the student know how to express two of the unknowns in terms of the third unknown; that is, he must understand the relationships of the details stated in the problem.

Various patterns of organization of details produce different effects, though the facts themselves may be essentially the same. Thus, if facts are compared, we receive a meaning different from that which we would obtain if the same facts were merely related in chronological sequence. Students, therefore, must be taught not only to read for accurate literal understanding of individual facts but also to understand the particular relationship these facts may have to other facts in the material.

Consider this paragraph:

> Even in our successful declaration of the Monroe Doctrine we were not leaders. Only the agreement of Great Britain, whose

> interests it also served, made it enforceable. We went through the rest of the nineteenth century doubling our population every twenty years. We increased our industrial capacity and established unity at home. By 1900 we were a power, a nation consulted wherever diplomats convened. That is, we had exposed Spain as a has-been by defeating her handily in war; we had acquired new and distant interests in the form of Puerto Rico, the Philippines, and Queen Liliuokalani's romantic Hawaiian Islands. We now had the beads that go with being a dowager.

Whatever we may think of the author's choice of metaphor in the last sentence, the paragraph as a whole builds a picture of rapidly growing maturity and power, of a nation coming of age and proud.

Consider how quickly this impression is modified by the very next paragraph in the text:

> But we were still a little gangly in our new maturity; we tripped

> spirit of diplomatic isolationism.

> (Robert Rienow, *American Government in Today's World.* D. C. Heath, 1966, 511-512.)

Either paragraph by itself creates a picture of the relationship of the United States to other parts of the world at a certain point in history; but to understand what the author means, the student must recognize the relationship between the two paragraphs. Over and over again, competent reading requires a study of such relationships for accurate literal comprehension.

Exact, literal comprehension always seems very important to teachers of mathematics, science, and related areas. It may seem less important in a subject such as literature, but in my opinion it is not. Before a student can react imaginatively and critically to literature, he needs to be in full command of literal meaning. If he does not understand, for example, the full literal meaning of the phrase in the Frost poem "crannied with whiteness," the opening image will be unclear—as will the second image if he fails to know literally how a boy can see "himself grow tall."

Interpretation

Interpretation takes the reader beyond the printed page by requiring that he put together ideas which the author has not overtly related to one another, and by requiring him to see the connections between what he is reading now and his past reading and life experience. As an outcome of this process, the reader is able to make inferences and draw conclusions—in other words, to learn things the author only said indirectly. This process is at work in the reading required in all subject areas, though with differing degrees of complexity. Some poetry, for example, depends so heavily upon the ability to interpret that, for the unsophisticated reader, it is nearly unintelligible. But the same process is involved in reading an algebra problem.

Consider what is required in this algebra problem:

> With a tail wind, a jet plane flew 2400 miles in 4 hours, but it required 6 hours for the return trip against the wind. Find the airspeed of the plane and the wind speed.
>
> (Mary P. Dolciani et al, *Modern School Mathematics,* Algebra 1. Houghton Mifflin, 1967, 250.)

There are unstated facts which are necessary to the solution of this problem: that distance is the product of time and rate; that the speed of a plane flying with the wind equals its own speed plus that of the wind; that, conversely, its speed flying against the wind is equal to its own speed minus the wind speed; that the solution of a problem like this requires two equations. All of this information has to be brought to the problem by the reader, either from previous experience with similiar problems or from reasoning from the facts as given. This process is as much an act of interpretation as is drawing conclusions about the characters in a novel by piecing together various bits of information about their behavior, their speech, or their appearance.

Evaluation

The evaluation aspect of the reading act—often called critical reading—requires that the reader depart from the printed page in another direction. He must make judgments rooted in what he has read, not in his personal feelings and prejudices. He must sort facts from opinions, ask whose opinions they are or what the sources of the facts are, and evaluate the logic of the reasoning represented in the material he has read. He must consider the relevancy, authenticity, and utility of factual material. He should see, for example, that the first half of the first sentence of the algebra problem presented at the beginning of this paper is irrelevant to the solution of the problem. The student who intelligently evaluates will also see immediately that the writer of the paragraph about Castro was using prejudicial words in describing him as a "flamboyant young revolutionist" with a "dictatorial" and "leftist" government which encouraged "shouting" against "Yankee imperialism." That this kind of language may be acceptable to many people in describing Castro could tend to blind the young reader to the fact that it is not straight reporting. He should be alerted to the situation and reminded that more than one major figure in history has been thus described by his contemporaries. He needs to learn to be intelligently wary in his reading, to know that many writers, deliberately or otherwise, reflect a specific point of view or are "grinding an axe." He must also realize that such axe grinding does not make writing bad; it only makes reading bad when it is unrecognized.

Critical reading or evaluation in literature is basically the same, though materials with which literature deals are usually nonfactual. The reader must weigh and judge, always from a background of experience or earlier reading. Hence, he may evaluate the logic of a character's behavior by comparison with his own experiences or by his observation of characters in other novels. In another, more abstract sense, he may evaluate the way an author has written—the style rather than the content. Thus, the reader may judge the effectiveness of the caesura in the Frost poem:

"Strange peace was here. Even the dog's bark," etc. He must also see that style often has a good deal to do with the way he feels about the content. If he doesn't recognize this fact, he may be "taken in" by an interesting style to the extent of being uncritical of meaning.

Assimilation

Assimilation is the process through which the reader makes use of his reading. Every act of reading potentially affects not only every other act of reading but also the nonreading acts which a student will perform. The simplest, most direct way in which assimilation affects the student is in the growing confidence he acquires in the use of the skills. Gradually these skills become, through practice, so natural to him that he develops an automatic response, the goal of all skills teaching. When he needs to skim, he automatically does so. When he needs to read for complete recall, he does. He has truly assimilated the skills; they have become a part of him.

The content teacher in any area has much to do with skills assimilation. First of all, the student needs as much practice as he can get to hasten the development of the automatic response, practice of the kind which keeps him aware of the skills he is practicing. If this activity is provided in every class all day long, the student will have full command of the process much sooner.

But assimilation is more than this. It is concerned also with concepts which are derived from reading. Assimilation of concepts is necessary for all in-depth, evaluative reading. The first material a person reads about any given subject, unless that subject is something very familiar to him in his personal life, will necessarily be read superficially, though the person may spend a good deal of time and effort in the reading. Thus, the paragraph about euglenas is all but meaningless unless the student has assimilated at least the information about one-celled plants and animals which precedes it in the text. No one can read in depth unless he has acquired ideas about the subject from much previous reading and /or experience; all reading is shallow until the reader has assimilated many related facts and ideas. This is why broad library reading is so necessary. It is also why the learnings from sources other than printed materials are important to the reading process.

In addition to assimilation of skills and concepts, the student assimilates attitudes derived from reading. Most educated people can name one or more books which have really changed their lives. The printed page is a powerful instrument. We too often assume that it is the English teacher's special responsibility to help students learn to use this instrument wisely in their struggle to grow mature morally and spiritually, as well as intellectually. The assumption that the English teacher has the breadth of background to introduce students to significant and powerful books of all kinds —books which can really change attitudes—is unfounded except, perhaps, in rare instances. In many cases, and with certain students, the science teacher, the physical education instructor, or any other member of the faculty outside of the English department could have far more success.

The Skills

From a totally different viewpoint—that of the skills involved in the various parts of the reading act—the teacher may also recognize common elements which are inherent in the study of printed materials in any content area. Complete analysis of specific skills would be much too lengthy a process to be included within the scope of this paper. I shall, therefore, consider only three groups of related skills which are particularly important. These groups of skills cut across all subject areas:

1. Ability to survey material, set purposes for reading, and determine an appropriate technique for the reading of any given piece of material.
2. Ability to handle graphic and illustrative materials.
3. Ability to locate, comprehend, and combine information from a variety of library resources.

Surveying

Too many students plunge headlong into any and all types of material and find themselves immediately swamped and even drowning. A few preliminaries would prevent this problem. The preliminaries include the act of surveying the content (looking at graphic material contained therein, noting headings in a different type, and reading study questions prior to reading the text itself); deciding upon the specific purpose or purposes for the reading (hopefully established as a part of the assignment); and, after considering what has been learned by surveying and setting purposes, determining the kind and depth of reading and study necessary. Poor readers are often passive readers who expect, somehow, that all they need do is look at the page. They naively believe the author has done all the work. They tend to ramble through the material, expecting they will somehow remember what is there. The survey technique prevents this kind of reading. It is suitable for all kinds of study reading and provides a general framework within which the student may work purposefully and aggressively toward a known goal.

The survey technique is appropriate in the reading of mathematics, where the first quick reading (a survey of the problem) alerts the student to the kind of problem he must solve and gives him the mindset for a problem of this type. It is appropriate, also, in a literature assignment. Though we don't want the student to read the ending of a short story before he has read the story, we *do* want him to look at the illustrations, which should pique his interest and make him wonder about the characters and what they are doing; we *do* want him to read the study questions so that he will be alerted to problems of character or theme; and we *do* want him to discover during his survey whether this is an easy story about something familiar to him or a difficult one, set in some remote time or place, making it necessary to adjust reading speed and give attention to details.

Surveying prior to detailed study is particularly important in social studies because of the extreme concentration of detail; there are at least fifteen facts in the paragraph about Castro. Surveying prior to complete reading helps students focus on important points. It results in greater efficiency. It is a technique all content area students need to use with most assignments.

Reading of graphic materials

Study materials frequently make wide use of illustrative and graphic devices: pictures, charts, tables, maps, graphs, cartoons. We live in a picture age. Modern techniques of printing make it possible to use these devices in profusion. The materials involve a condensed type of language which expresses various kinds of relationships, often very complex ones. Some illustrations are particularly difficult to read; yet, once mastered, they may contribute more to understanding than the verbal symbols which they accompany. Since they are found in the study materials of practically every subject field, developing student skill in handling graphics is an important responsibility of all teachers.

Using many sources

Ability to locate, choose selectively, discard systematically, comprehend, and combine information from a variety of resources are complex skills important in every content area. Organized notetaking is a part of the process. Teaching these skills and seeing that they are used repeatedly are responsibilities which require the best energies of both media specialists and subject teachers. The day when single textbook teaching was adequate—if it ever was—has gone. We are moving so fast today that every content textbook is obsolete before it can be written, published, sold, and placed in the hands of students. Without the resources of the media center, students could never be up-to-date in their information. It becomes, therefore, a major responsibility to teach students how to find information they need (in whatever medium it best appears), to take notes from a variety of sources, and to combine this information in well-organized, meaningful ways to supplement what they may be learning from their texts. Library materials place a special premium on the evaluative and assimilative aspects of the reading process and they are often neither so clearly written nor so carefully organized as textbook materials. Greater reading skill is required to use them successfully. Using related media adds a new and very important dimension to the student's study, but it makes his task harder. Unless we all stand by to help, the student may drown in the mass of material at his disposal.

Concluding Statement

In summary, then, all six parts of the reading act are common to every subject in which printed materials are used: word recognition, assigning of meaning to the printed symbol, literal comprehension, interpretation, evaluation, and assimilation.

Cutting across all six parts of the reading act are three very important generalized types of activities, each involving several subskills, which must be taught if students are to read intelligently for purposes of study: ability to survey, set purposes, and determine an appropriate technique for study; ability to handle graphic and illustrative materials; and ability to locate, comprehend, and combine information from a variety of media.

The degree of emphasis given to each of these aspects of reading in each content area depends particularly upon four factors. In the first place, the subject materials themselves control to a large extent the kind of emphasis needed. The expository language of science and mathematics tends to be terse and exact, allowing no fuzziness in its literal comprehension. Texts in these areas are also highly sequential, making the assimilative component of reading crucial. On the other hand, foreign language texts, at least for the first- and second-year courses, have some of the characteristics of basal readers for primary grades. Vocabulary is severely controlled and comprehension is very simple. Students are busy learning to read words and to understand increasingly complex sentence patterns.

Secondly, student readiness governs the emphasis on particular aspects of the reading act. This readiness is partly a product of the elementary school reading curriculum, including the amount of transfer which elementary teachers have succeeded in accomplishing between a basal reading program and the reading of content materials at that level. Too often, the elementary program is weak in developing strength in the reading of exposition, and we find students in secondary school for whom "reading" means "reading a story." Readiness is also a product of the intelligence of the students, of their socioeconomic background, and of their probable goals in future education.

In the third place, the degree of emphasis which is given to each of the common elements in the reading act depends upon the basic philosophy of the school as to its curriculum objectives. If the school is content-centered with emphasis on *what* students learn, the emphasis will tend to be on literal comprehension (including grasp of organization) and on recall of facts. If, on the other hand, the school is child-centered with a major concern for *how* students learn, the emphasis will tend to be on critical reading, the ability to collect and collate materials from many sources, a broadened taste, and more catholic interests in reading materials.

Finally, the kind of class activity which is most frequently used will have a good deal to do with determining the emphasis given to various aspects of reading in each content area. For example, individualized instruction or intraclass small-group work tends to emphasize the interpretive and evaluative processes and the ability to locate and combine ideas from many sources.

Basically, however, the job is the same in all content areas. To put it very briefly, it is the task of showing students how to get into a printed page, how to get what they want from it, and how to get out of it when any more time spent on it would be wasted. There probably isn't a reading specialist anywhere who really knows how to do this equally well in all content areas. Only the content specialist can accomplish the task with real understanding. This is one of the important reasons why the teaching of reading in the secondary school belongs in the content area classrooms.

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Integrating Reading Skills in the Content Areas

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IN PLANNING A READING PROGRAM, it is necessary to know what attitudes and skills are involved in efficient reading and when they are most readily developed. The results of research show that progress in certain skills of reading is most rapid and reaches maturity at different times in the continuum from primary grades to college. Development in reading skill at the secondary school and college level is evidenced in the more mature types of interpretation, critical reaction, and synthesis involved in efficient reading. The ability to understand and interpret critically content material in secondary school and college classes requires a level of intellectual maturity, an extended vocabulary, a wide background of experience, and a mastery of language forms not evidenced by or characteristic of elementary students.

To meet the demands of society today and to develop mature, efficient readers in the secondary school, we need a comprehensive, flexible reading program which recognizes that development in reading skill is continuous. To accomplish this Herculean task, we need the full cooperation and active participation of every teacher in the secondary school. Unfortunately, the secondary teacher in the past frequently has not viewed the teaching of reading as one of his responsibilities. Yet, the content area teacher is the best-qualified person in the school for teaching reading in his subject. He is the one who 1) is most capable in teaching the new vocabulary in his subject, 2) is most knowledgeable in setting purposes for reading, 3) is most able in developing and motivating student interest, 4) is most adept in identifying important concepts to be arrived at, 5) is most conversant with multiresources, their use and value in developing background experiences, and 6) is familiar enough with the text to know how best to read and study it.

To this point, everything seems simple and logical—the big problem is the preservice education of secondary teachers. Most secondary school teachers are not prepared in attitudes or in knowledge to assume the responsibility for the teaching of reading. How, then, do we proceed?

Needless to say, there is always more than one way to attack a problem and more than one possible solution. The decision as to method and procedure has to be made in light of personnel and each particular situation. Then an inservice program which will accomplish the stated objectives has to be planned and developed. I would like to share with you my experiences and ideas in developing a comprehensive reading program with high school teachers. The approach to the problem is threefold: 1) recognizing and/or identifying the need, 2) developing the program, and 3) implementing the program.

Recognition

Because most secondary teachers have not had any reading courses, it is necessary to provide minicourses oriented toward an understanding of reading skills and their importance in helping students gain knowledge. These minicourses build the background of the instructor and help him to understand the reading process; they provide the information that will help him to make reading instruction a basic part of the teaching of his subject; they help him learn how to determine each student's proficiency in reading his subject and, also, to identify those reading skills in which a student needs to be proficient in order to achieve success in his subject.

To expedite this phase of the program, a reading consultant should be cognizant of the needs of the students in the school; be aware of the background, experience, and training of his teachers; and have a basic plan in mind for initiating the program. I believe it is important to include the entire staff from the very beginning. It is true that the development of the overall program may be slow as a result, but in this manner every teacher has an equal opportunity to build the program.

The process of determining the needs of the students is one positive way of "selling" a reading program to the staff. By examining the cumulative folders and evaluating the test results over a period of years, grades earned in various subjects, and other types of information available, a faculty can learn a lot about the students. At the same time, a consultant can learn a lot about his teachers in relation to their inservice needs in developing a reading program.

I strongly advocate the formation of an all-school reading committee. This committee should consist of one teacher from each curriculum offering and serve as a focal point of the program. I would include teachers with all levels of experience—from a beginning teacher to a master teacher with many years of experience. I would choose teachers who have taken courses in reading and, of course, teachers who have not. I would, also, include a teacher who is opposed to the program, if there is any. The reason for the heterogeneity in the committee is that there is heterogeneity in staffs, and I feel that this is a more democratic approach to curriculum development. The weak teachers and the "stone throwers" are all going to have to be developed and converted anyway, and it is easier and more beneficial to do it at the beginning of the program.

The prime purposes of the committee should be to identify the specific needs within each department (relative to the utilization of skills by students) and decide how best to meet these needs. This committee should also receive communications relative to the needs and wishes of teachers in each department regarding their knowledge of reading and their ability to incorporate the use of reading skills into the mastery of their specific content areas.

The consultant should provide the leadership, stimulation, resources, and media from which the program can grow and develop. The committee members should be instructed in the basic fundamentals and, in turn, instruct the members of their departments. Selection of department representatives is very important because these people must merit the respect of their colleagues.

In working with secondary school teachers, I have used the following approach in developing a reading program. We identify three basic areas of concern: use of textbooks, vocabulary development, and organizational skills. All teachers know something about each of these areas, and each area is of immediate importance to the student in achieving success in learning. The content area teacher knows best how each part of a text is important in the mastery of a course and how best to study a text. Knowledge of vocabulary is essential to learning, and organization skills give system and sequence to learning. Once teachers are knowledgeable and secure in these three areas, the foundation is laid and we are ready to expand into the realm of more advanced and mature skills.

Development

General information and instruction relative to each of the three areas are given to the members of the reading committee who, in turn, instruct the members of their various departments. It is the responsibility of the representative of each department to supervise the development of actual plans and suggestions as to how these reading skills will be presented and taught in his specific content area. Every teacher in each department participates and has, therefore, a share in the active development of the program. Each teacher has the opportunity and responsibility of developing procedures for presenting a text to the class, introducing methods of improving vocabulary, and utilizing techniques for teaching organizational skills. These suggested plans are given to the committee for evaluation and to make sure they are consistent with the overall philosophy and objectives of the reading program.

All of this activity takes place during the first year. In actual practice, the first semester is spent developing background and capitalizing on previous experience through discussion and motivation provided by other "experts" from colleges and universities in the area. While teachers are developing plans and guidelines for each of these areas, the committee is formulating a philosophy and objectives. During the following summer, this mini-reading curriculum—philosophy, objectives, and suggested lesson plans—is reviewed by the committee for consistency and continuity among all areas of the curriculum. The plan is then duplicated so that all teachers will have copies for the beginning of the following year.

At the beginning of the second year, all teachers use the suggested plans and make any additions or deletions they feel would improve the mini-guide. The next step is to enlarge the mini-guide during the second semester of the second year by including additional skills determined by the committee. Because the reading consultant orients the committee and provides extensive background for the next development, sequence and continuity are virtually built-in factors. As the new skills are introduced to the teachers, suggested methods for their use are developed and immediately tried out.

The preceding procedure has been of a very general nature; now it is time to outline the specific steps. A good secondary program is a continuation of the elementary school program; therefore, it is important for secondary school teachers to know what has been done and how. To emphasize the sequential development of reading skills, we selected one teacher from each elementary grade level to tell how reading skills were taught in the elementary curriculum. We used a variety of activities, such as, closed-circuit television, small group teaching presentation, tape recordings, and simple explanation of step-by-step procedures. This agenda was followed with a presentation by one of the nationally known reading experts on "The Place of Reading in Secondary School Subjects."

Our next objective—to arrive at a definition of reading acceptable to all disciplines—began first at the "committee" level, where we searched the literature and did some initial sharing of ideas. Then each content area representative discussed the topic with his department members and returned to the committee with a recommendation. A completed or final definition was developed and communicated to all departments.

The next area to be studied by the committee was the textbook, and this work was done, literally, page by page. Each section or part of a text was listed, then the specific use of that "part" was identified, and finally the best techniques for teaching it to a class were established. Every situation was slightly different because each text was used in different ways and to differing degrees in each content area. In addition to the title page, copyright date, preface, table of contents, index, maps, charts and graphs, the following specific strengths and weaknesses were noted: differences in styles of writing, organization of content, and the manner in which new vocabulary was introduced. A condensed version of this analysis was communicated by the content area representative to his department, and then a plan was developed by each teacher—a plan by which he would "introduce" a text to the class and then continue the basic instruction of its use.

Vocabulary development was the next major area of study and encompassed all aspects from word attack skills to deriving meaning through context. Committee and departmental discussions centered around the "how" to teach new vocabulary. A sharing of ideas on how best to teach vocabulary elicited a list of 35 different procedures. Once again each faculty member developed an initial plan on "how to," followed by additional plans which would show a sequential development of vocabulary skills.

The third and last orientation unit was that of organizational skills. This was a broad area specifically intended to include all content areas. English teachers assumed the responsibility of teaching the mechanics of how to outline; social studies teachers applied this skill in note making; mathematics teachers, in step-by-step problem-solving techniques; science teachers, in determining procedures in completing experiments; shop and home economics teachers, in designing and making wood projects and foodstuffs. Each teacher determined the purpose of the skill and developed a plan designed to fulfill the major objective—its integration in the content curriculum.

After each one of these three major areas had been developed and "tried out," all plans were rewritten and given to the committee, who in turn put them together with the philosophy and objectives for the final editing process. The following year, each teacher was given a completed guide and participated in a daylong inservice program in which the guide was reviewed and instructions were given for its implementation. Specific time allotments were assigned to the integration of each skill in each content area. An advantage of this procedure was that all teachers were participating in a common cause.

As teachers developed confidence and security, they were encouraged to become acquainted with additional skills and to follow a similar procedure in the integration process. All of these approaches were funneled back to the committee, who in turn assumed responsibility for communicating these advances to the members of their various departments.

The main advantage, as evidenced by everyone, was that each individual was involved right from the beginning to the end of the first three years. Too often a group of selected individuals sits down and develops a beautiful guide or curriculum and then presents it to the staff. This may result in a professional document to "show," but I doubt that it stimulates much activity and progress in the school program.

A number of years ago, as a Ford Fellow, I visited colleges and universities and public, private, and parochial schools to observe and determine the extent and quality of reading instruction. There were many times, when visiting classrooms with the principal or supervisor, that I discovered that instruction was very inadequate and unrelated. This impression was especially unfortunate because I was always being taken to see a teacher who was "absolutely tremendous!" In each instance, an extremely professional, well-developed reading curriculum had been given to me to prepare me for what I could expect to see going on. None of the teachers that I visited had participated in any way in the development of the guide.

Implementation

The third phase, implementing the program, is a composite of the first two steps. Actually, what we are doing in this step is taking the now familiar skills and determining which ones can best help achieve the goals or objectives of our curriculum (identifying the needs). Each curriculum in our high school consists of desirable concepts and objectives to be arrived at and achieved. It is our responsibility to determine which of the many individual skills will best help achieve this goal. Once the skills are determined and allocated to each particular unit, the next step is to determine the kinds of learning activities and the types of questions to be asked to guide and motivate thinking (developing the program).

Up to now, I have not mentioned anything about appraising the needs and abilities of the students. We do have and use the usual standardized test results but only to give a general idea about the range of the abilities of the students. A more advantageous method is the utilization of informal skills tests based on the textbooks that are actually used in the class. Small groups of teachers work together in developing these informal tests—for example, those teachers who use the same text in a United States history class. The use of these tests brought immediate attention to the fact that some students could not read the basic text, and concern was evidenced as to why. We did some readability tests and found that some textbooks were just too difficult for students to read independently. This "finding" in social studies brought about a rash of requests from other departments. Ninth grade science teachers found that a book that had been "sold" to them by a sales representative as being written especially for "C" students was actually only readable at the 11th grade level and above!

Teachers of low level classes in social studies found a significant increase in student achievement when another textbook at a lower level was introduced. And, of course, as soon as the level of student achievement increased, a positive change in student attitude and behavior was noted.

Thus, we became involved in a constantly spiraling, all-encompassing program of the integration of reading skills in the secondary school curriculum.

The advantages of this integration of reading skills in content areas are several: the total staff is involved from the beginning; each skill is initiated individually; there is immediate opportunity to execute change in the reading skill integration process; and the skills program is activated immediately.

Generally speaking, the basic uncertainties of change upset teachers. If they are involved in the planning process and are actively participating in the "input" phase of curriculum development, the uncertainties are no longer present. Teachers know what is going to occur, and they know the *how* and the *why*. Also, anxieties are reduced by dealing with smaller units in the sequential, organized fashion I have described.

Throughout this presentation I have avoided identifying a sequence of skills or listing specific skills to be presented. Other than the three broad categories which I have mentioned, I don't believe that there is a sequence of skills that we should follow. I believe that instruction should be based on needs—needs of students relative to meeting requirements of a prescribed course of study. Before students and teachers can become aware of their needs, they need to be aware of certain elements in their environment which are conducive to learning. A doctor is trained in the use of his instruments to treat and diagnose patients; a mechanic is trained in the use of tools to repair automobiles. Just so, teachers and students must be trained in the use of reading skills to obtain knowledge. If students have the opportunity to develop efficiency in reading skills, they will have an abundant capacity for ongoing development and will have the ability to understand, analyze, evaluate, and form judgments from the material read.

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Meeting Special Reading Needs in the Content Area Classroom

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THE PRINCIPLES of applying reading in the content area classroom have been thoroughly detailed in the literature. In fact, the considerable body of literature on this topic over the past fifteen years encourages the concerned observer to assume that there is widespread acceptance of these practices among subject matter teachers. Normal pursuit of the ideal would then logically dictate a careful investigation of the "special" reading needs content area teachers find associated with their subject matter; that is, which reading problems are so closely related to the content, the subject matter and the classroom itself that only the content teacher, rather than the special reading teacher or consultant, may resolve them.

Not unexpectedly, the literature of reading in the content fields reveals little on these so-called special reading needs. Most periodic offerings are expository in nature, outlining or elaborating on the reading practices which may vitalize content area teaching. Other, more specialized, investigations provide little additional evidence. Emans and Urbas (*1*), for example, studied the effect on underachievers in English of reduced grammar and essay writing with increased emphasis on reading instruction. Olson and Rosen (*4*) conducted a much-needed study of reading practices actually applied by content area teachers. Their survey included 585 junior and senior high school teachers, representing seven content areas, who responded to a checklist of twenty practices related to reading in the content areas. As reported by Olson (*3*), the study seems to indicate that teachers generally feel they are adequately observing recommended principles which apply reading practice to content teaching. Generally speaking, although the investigators note some apparent contradictions and discrepancies among the respondents, subject matter teachers are aware of and are concerned with sound reading practice.

Neither of these more specialized studies, however, is concerned with special reading needs in content teaching as here defined. Emans and Urbas focused on underachievers in English, and the content area teacher was not solely responsible for the effort to meet the identified needs. The practices surveyed by Olson and Rosen are those most commonly recommended by reading authorities interested in subject matter problems.

Consequently, the writer set out to learn firsthand what special problems might exist and how they are resolved. The most reliable primary source would appear to be the teachers themselves—both the special remedial and developmental reading teachers and consultants and the content area teachers alert to the reading needs of their students. Over a period of several months, the writer visited schools and classrooms; observed teaching; and discussed the problems of content area teachers as noted, first, by the specialized reading personnel and, second, by subject matter teachers themselves. In the process, approximately fifty teachers were consulted, individually and in small groups. The teachers ranged in sophistication from highly competent reading personnel deeply involved with large school systems to relatively inexperienced teachers struggling with subject matter in their early years of teaching. In level, the range extended from the middle grades through the senior high school. In all instances, however, these were teachers with an avowed interest in reading problems associated with the content areas. The results, conclusions, and implications, however, that may be drawn for these interviews, do not speak for the large majority of secondary teachers. The commonality of reading practices among secondary teachers may be adequately represented by the Olson-Rosen survey cited earlier.

To forestall possible misunderstanding, the following definitions are used throughout the discussion: a) *specialized reading teachers* are those who devote the majority of their school day to reading instruction as a primary function—i.e., outside the classroom as remedial, corrective, or developmental teachers, reading supervisors, or consultants; and b) *content area teachers* are those teachers whose primary responsibility is within the classroom and is involved principally with accepted curricular subject matters.

In almost all cases, teachers were asked to respond—either orally or in written form—to the following hypothetical situation:

> Marion, age _____, has not been meeting the specific reading needs in ___________ (content and level). His test scores, however, indicate that he has no particular reading difficulty which would require referral to the reading teacher. Rather, he shows inability to deal with the unique reading demands of this subject area, this content. It may be that he lacks the experiential background necessary to deal with the concepts or he is unable to cope with the vocabulary or specialized comprehension skills necessary. At any rate, despite generally satisfactory reading scores, he just cannot read *this* subject matter adequately.
>
> How would you identify Marion's problem more specifically? How would you, the content teacher, deal with his problem? What techniques, materials, approaches would you make use of to remedy his deficiency within your classroom, without referral elsewhere?

The results of these interviews are surprising and revealing, in some ways depressing and in others quite encouraging. The following remarks contrast opinion and experience as reported by the specialized reading personnel with the evidence of classroom practice observed by the writer or as reported to him by content area teachers.

With few exceptions, specialized reading personnel were largely negative regarding the degree of concern for reading expressed by content area teachers. Not only did these specialized reading personnel fail to identify any significant special reading problems in the content areas, they were skeptical of any considerable concern for the ordinary reading problems—those consistently identified as requiring daily classroom attention. These accusations of neglect were directed at all levels of teaching, with secondary teachers being the most consistent offenders.

Briefly, in the opinion of the specialized reading personnel interviewed, reading in the content areas is characterized by the following difficulities:

1. Content area teachers cannot identify the basic reading skills and, seemingly, are not aware of how these might effect classroom efficiency.
2. Content area teachers are not aware of the reading demands of their own subjects, even to the extent of assessing the difficulty of their textbooks; this conclusion was drawn despite the fact that the difficulty level of textual material has been widely accepted by most subject matter professionals.
3. Content area teachers persist in making assignments without giving directions or establishing purpose. As one reading teacher claimed, a student came to her for help with this plea, "I was told to read this for tomorrow. Where do I begin?" As another reading teacher remarked, "All the students have to know is [supposedly] on the board."
4. Content area teachers continue to emphasize content with extreme reliance on facts while failing to appreciate the kinds of reading habits necessary for or developed by such teaching. In one case, the reading specialist had taken great pains to help a student prepare for a major test and was confident that the student knew the material thoroughly. But the test was concerned wholly with facts and details as opposed to the examination of broad understandings of basic principles.
5. Content area teachers fail to provide any specific background in referring students for special reading help. In one case, the reading teacher quoted the content teacher's referral: "He (a seventh grade boy) watches too much television, is generally a discipline problem, and just can't read." Although two-thirds of referrals for reading help come from content area teachers, the recommendations are usually vague and general.
6. Content area teachers are accused of ignoring the other obligations students face during their normal school day; teachers tend to overemphasize the importance of their own subject matter, regardless of similar pressures endured by students from other teachers. Special reading teachers feel that content area teachers fail to give students a sense of success or to stimulate intrinsic motivation.

7. Even those content area teachers who do come to reading personnel for assistance broach problems which have long been assumed as "standard": how to lecture and take notes; how to use the library; how to use the textbook.
8. In general, the reading experts in a school or system find it difficult to reach content area teachers for cooperative work with students. The two groups cannot even reach agreement on such commonly accepted methods as SQ3R.

These special reading teachers consistently recommend the following:

1. The intercession or intervention of the school administration as necessary to bring together content area teachers and reading specialists for improved reading in content area teaching.
2. The use of differentiated instruction to reach the various learning modalities of the students. In one case, a freshman student finding difficulty with Shakespeare's *Julius Caesar* developed the skills essential for reading his text after listening to a recording of the play which was provided by the reading teacher.
3. The kind of patience and encouragement which provides the student with a sense of success or at least of acceptance of his own limited reading aptitude.

It is quite possible that these problems are more prevalent in larger systems where special reading personnel are active and where it is simple for content area teachers to assume that *all* reading problems are automatically referrable to reading personnel and, therefore, not the responsibility of the content teacher.

On the other hand, perhaps the real picture is less pessimistic than the preceding indictments presume. For, in visiting content area teachers, the author became convinced that truly responsible and successful subject matter teachers are concerned with reading problems in their classrooms and are in many cases uniquely meeting them. It is still true, however, that "special" reading needs in content areas are no more successfully identified; the reading problems and solutions specified by content area teachers in this narrative are definitely standard. Furthermore, the many teachers visited and interviewed are probably not representative of all content area teachers. Primary interest in the search here under discussion was for teachers who had manifested concern for reading as it related to their content area needs. Such teachers would already be exercising the standard reading procedures and would be most likely to identify special content area reading needs. So, in spite of the generally optimistic results reported (without total conviction) in the Olson-Rosen study, there probably exists a considerable "grey" area of content area teachers not familiar with or not recognizing the normal content area reading needs of their students.

Certainly the evidence gathered in this search does reinforce to an extent the findings of Olson and Rosen. *These* teachers do recognize the reading problems peculiar to their classes, their subject matter, and their materials:

1. They recognize conceptual and experiential deficiencies.
2. They contend with poor motivation and strive to develop and expand student interest.
3. They differentiate between general and specialized vocabulary needs and reach for the conceptual understanding beyond mere recognition of the word.
4. They extend outside reading.
5. They differentiate level in order to meet special reading needs.
6. They find time for individual work and seek materials to fit specific needs.
7. They use a variety of media to interest their students.
8. They adapt work and teacher-student expectations and are deeply sympathetic to the plight of individual students.

Solutions

But, as has been stated, they do not seem to recognize or identify the special reading problems associated with content. The problems they signalize are those generally substantiated in the literature, such as are usually contested by the practices surveyed in the

Olson-Rosen study. Of interest is the fact that most of these teachers make use of a master vocabulary list for their content areas; they attempt to group to meet individual differences; and, somewhat strangely, many favor cloze techniques to assess comprehension.

Illustrative of some of the experiences encountered during this survey are the brief cases which follow. None is particularly startling or innovative. On the contrary, they merely represent good—normal, recommended—practice. Nonetheless, it is enlightening to examine them, and their recitation may offset some of the negative views expressed earlier in this paper.

1. This most heartening experience is best described in the words of the teacher himself:

> Marion, age eleven, reads the words in the social studies text but doesn't comprehend the concepts that are presented. In identifying the problem, I asked him some questions about a series of pages that were assigned. I asked a few specific questions and asked him to locate the answers in the text. This he couldn't do. I helped him find the answers and asked Marion to read the paragraphs aloud. He did this very fluently. After he finished (the pages covered Iowa), Marion asked why farmers grow crops. When asked what people and animals eat, he answered that the only thing an animal ate was grass and that people got all their food from stores.
>
> When I discovered that Marion had never been on a farm and had never been out of his own hometown except to visit a sick aunt, I visited his home. Marion's mother agreed to allow him to visit my father's farm with me the following Saturday. Marion was very excited that day when we reached the farm. We did many things, including taking a load of cattle to a nearby town.
>
> Since then Marion has read every book he can find on farms because he now understands what he reads.

2. A thirteen-year-old boy had constant trouble with geography, attributable both to his own limited environment and to little understanding of life outside his immediate surroundings. To emphasize distance with him, the teacher grouped him with other students of similar difficulty. They were to gather materials for a

unit by mail; they located cities, studied maps, found zip codes, and then traced their own letters with colored markers on a map as they traveled to and from the destination. In a somewhat analogous case, a teacher in a remote rural county discovered that his fifth grade children scarcely knew their own county, let alone the state history prescribed by the syllabus. So the teacher concentrated on local background thoroughly and at length to develop motivation. He remarked wryly that the students enjoyed and profited from the experience, even if the principal was not particularly happy.

3. For a sixteen-year-old boy, probably nothing is more important than earning his driver's license, a task which requires textual mastery as well as "behind-the-wheel" competence. The driver education teacher recognized that this was the only subject which had ever truly interested a particular student. Excellent on the road, the boy could not master the text or pass the tests. Consequently, the teacher grouped him with boys who read well so that he could gain from listening. The teacher then rewrote the text in outline form and administered a test based on the simplified material. The boy earned his license and both teacher and student were happy.

4. The bored, nonreading high school boy is common. In this case, the boy posed daily disciplinary problems. He was seeking only to get out of school so that he could "join the Air Force and fly." Discovering this ambition, the senior English teacher gathered a variety of stories on flying to interest the student—"Kitty Hawk," "Lindbergh," "Chutin' for Fun." The teacher reported that nothing miraculous happened but there were some evidences of improvement in attitude. In another situation, an eighth grade farm boy was "hostile to literature." The teacher talked to the boy and learned that he was interested in trapping. The teacher then located books on trapping fur animals and gave them to the student. Later the teacher reported, "I have observed him reading books which he doesn't have to read for book reports. . . . At least he's reading now."

5. Once again, in tenth grade geometry, the teacher herself best explains the situation:

> Marion has trouble following directions in daily assignments and in tests. However, when asked questions during class

> discussion, he seems to comprehend and answer intelligently. He has had a history of near failure in mathematics classes when the solution of verbal problems was required, but he has had moderate success with computational units. He has average intelligence as shown in test scores, scoring much lower on the verbal problem section than on the computational skills.
>
> Fortunately, much geometry can be learned by drawing with straightedge, compasses, and protractors. Many exercises of this type are assigned so he and others like him can learn some geometric concepts without reading. . . . Geometric proofs (impossible for Marion) are assigned to everyone, but most of the proofs are mimeographed and handed to the students the next day. These mimeo proofs have "holes" which students like Marion can fill and hand back the following day. Thus, even though he cannot do a long proof on his own, Marion can fill in a few missing ideas and feel some degree of success. He might even catch on to the idea of proof well enough himself to do a short one alone by the end of the year.

The reader will note that the cases generally center around social studies and English, the secondary reading subjects. The few science teachers interviewed in this study complained of lack of interest on the part of the students—"they just don't like it!"—and found that students were unable to grasp the conceptual basis of the subject matter. These views agree with the masterful analysis of reading problems in the sciences done by George Mallinson (*2*) who noted that most difficulties occur in general science, general biology, and general physical science, studies which lead to student discouragement because of the complexity of the subject matter and oftentimes inferior motivation and aptitude on the part of students.

Conclusions

What, then, may we conclude from such conflict of opinion and evidence as has been sketched throughout this paper? Where is the truth about reading in the content areas? Is it in the reputable study by Olson and Rosen, in the rather negative views of reading specialists whose interviews are cited here, or in thrilling evidence from a few cases? Perhaps the truth is still shadowed, still illusive. This author, however, hazards the following opinions—hardly conclusions—from what he has observed:

1. There is remarkably little evidence as represented in this survey that uniquely special, as yet unidentified, reading problems exist in the secondary content areas. No doubt they are there, still to be ferreted out through measures more adequate than interview, consultation, and observation.

2. Accepting the integrity of the special reading teachers cited, it is possible that reading experts are largely talking to themselves, persuading the converted, and still not reaching the mass of secondary subject matter teachers. Obviously, this opinion is not consistent with the major conclusions of the Olson-Rosen study.

3. Pleas must be continued and new measures discovered to enlist administrative interest in reading problems. As has been cited frequently elsewhere, only the administrators are able to bring the special reading talent of the experts and the special content talent of the classroom teacher together; without trusting cooperation between these sectors, both reading access to and success in the content areas will be negligible.

4. Perhaps eventual success in this endeavor will come only when a set of reading "performance criteria" has been developed for every classroom subject at every level and has been put in the hands of teachers who may be expected to apply it because of its very forthrightness and easy, practical use.

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The Birth and Development of a Comprehensive Reading Program

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DESPITE THE GROWING EMPHASIS on communication techniques which do not require excellent reading skills, I doubt that any thinking person in our society today would relegate the ability to read well and to use reading in carrying out avocational as well as vocational pursuits to a minor position in the hierarchy of educational needs. No matter how well one reads, there always seems to be a need to read better; no matter in what areas a person seems to read adequately, there always seems to be another area where one's reading skills could stand improvement.

However, for some reason, not fully understood by me, reading instruction in schools does not generally seem to reflect this sentiment. To be sure, at the primary level, the development of reading skills is considered to be of paramount importance. However, by the time the child has advanced to the fourth grade, he may spend a considerable amount of time under the supervision of teachers who do not feel that the teaching of reading is their responsibility. By the time the student enters high school, unless he is viewed as a "retarded reader," hardly anyone, including his English teacher, spends any effort in furthering the student's reading skills.

I am a former principal of the University of Chicago Laboratory High School. Our experiences since 1960 clearly reveal that the attention given to reading in our schools beyond the primary grades is inadequate and the assumption that reading need not be taught formally to high school students is completely untenable. Even for children who have spent seven to ten years in a pre-high school program characterized by uncountable numbers of experiences in reading and the other language arts, some reading tasks in the high school programs present major obstacles. The old saw which was mouthed with considerable persistence in the 1950's—"every teacher is a teacher of reading"—but not widely accepted (even by many of the English teachers whom I know) has found acceptance at U-High.

I am not going to tell you how a great many of our highly qualified subject matter teacher specialists have also gained competency teaching the special skills of reading in their content areas. Nor am I going to try to give you a glimpse of how they go about teaching reading in mathematics, science, or physical education. That is their part of this publication, and they will be far more convincing than I can ever be. I can best give attention to four basic questions:

1. How did this happen at U-High?
2. How has it worked out?
3. How does such an all-school commitment develop?
4. What is the role of the administrator in the development of such a program?

How did the University of Chicago Laboratory High happen to become committed to a schoolwide concern about reading?

The faculty of the University of Chicago Laboratory High School, a school with an enrollment of some 700 students, has, like other faculties, been bombarded with demands to adopt the various popular reading innovations. It is an unusual faculty, committed fully to creating programs which give promise of quality education to the students served. The faculty knew, even though the students were bright and seemed to be doing exceptionally well, that more needed to be done in the area of reading. Yet no one was about to jump onto one or more of the current bandwagons. Therefore, after considerable discussion the faculty, along with a principal who was concerned and also not interested in being caught up with the current fad, decided that a specialist was needed to help the teachers study reading problems and to find ways of meeting student needs revealed by such inquiry.

But what should this person be? Should a reading teacher be added who would work with a handful of students? Or should someone be found who could help all teachers become creative in improving reading instruction? For teachers who wanted help in learning how to improve reading rather than substitutes who would take over the responsibility, the latter alternative made the most sense. A reading consultant (even though no one knew for sure at that time just what such a person could do) might be able to alert an entire school to its needs, share insights, and perhaps enlist the entire high school faculty in a drive to improve the reading of all students. Getting all or a major portion of such a faculty concerned about reading and somewhat better prepared to help students meet the diverse reading requirements of the varying subject areas, appeared to be the greatest need to be satisfied.

When the consultant arrived, she joined with colleagues who were well seasoned in determining the instructional programs for their particular disciplines. Therefore, she did not come to direct but, rather, to help. It was recognized from the onset that any attempt to establish for the consultant a role which might be viewed by the faculty as reducing their decision making role with regard to the curriculum, would be met with resistance and perhaps doomed to failure. Upon arrival, therefore, the consultant, stocked with all sorts of helping materials, became available to serve on request.

No fanfare accompanied her arrival. Generally, the data concerning student reading looked good—average IQ of 128, median reading score at the 89th percentile, a large percentage of the students reading two to three levels above actual grade placement. Several persons even asked, "Why did she come?"

However, it was not long before teachers began to express some concerns. "Some students just never read the textbook. I'm beginning to wonder if they can," declared one teacher. A study of students' achievement in reading by the consultant suggested why. Test scores revealed that at each grade level there was a range in reading achievement of at least seven full years. These were problems of the kind no one in University High School had ever before fully realized.

As teachers became aware of the spread in reading levels, they asked the consultant to help them adjust their teaching to take into account this variability among students. While a compressed discussion of what has taken place in the eight years that followed does injustice to the work of the consultant and to a description of the evolving new roles of the teachers, a summary of what happened during this period suggests that far-reaching strides forward have been made.

When presented with evidence that study-reading is complex, not one general skill, teachers in several subject areas expressed an interest in and a willingness toward developing the skills needed to include reading instruction as an integral part of daily learning experiences. For example, the mathematics teachers asked, "How can we do more with reading in our classes?" With such readiness expressed, the teachers and the reading consultant sat down together and exchanged insights. The consultant was invited to watch the mathematics teachers hold "how-to-do-it" sessions.

Further examination of reading scores revealed that students were not doing so well in vocabulary development as in the areas of speed and comprehension, a weakness not to be expected in a highly academic school where students verbalized adult-sounding words with ease in class discussions. English teachers accepted this challenge by deciding that vocabulary activities needed to be incorporated into the English curriculum. With their consultant, teachers created an instructional sequence in vocabulary development and integrated it into the English curriculum throughout all grade levels in the high school.

Four activities for encouraging and facilitating improvements in reading through the use of the consultant evolved: 1) meetings with groups, 2) conferences with individuals, 3) classroom visits to give reading instruction in the presence of the teacher, and 4) the creation of a reading resource center. Group meetings were characterized by question raising on the part of the faculty: "What are our reading weaknesses?" "How can all teachers help all students become better readers?" These meetings aroused interest and gave the consultant an opportunity to offer assistance and to present data which stimulated action. Individual conferences focused on the specific problems which a teacher was having and often led to a visit of the consultant to help improve reading instruction in the teacher's classroom. Undergirding these activities was a comprehensive resource center filled with sample diagnostic materials, books, workbooks, and kits collected from publishers, as well as specially tailored homemade materials developed on the scene by the consultant and by teachers striving to solve reading problems.

Our efforts to enlist every teacher in improving reading have not been spectacular. Progress has been made slowly but surely. The consultant clung to the counsel in *The Shoes of the Fisherman*: "We must do the small possible rather than chase the great impossible." She found that, over a period of time, many half-steps made a giant step. In each case, teachers were expected to pick up the ball and run with it. From the beginning the consultant was advised, "Don't go rushing in." "Be nondirective yet catalytic." Teachers' requests for assistance developed rapidly and the consultant became very busy.

Of course, not all the present concern of University High School can be credited to the reading consultant. Some competent teachers were sophisticated in teaching reading skills long before she came. Nevertheless, many teachers welcomed the arrival of the full-time reading consultant and turned to her for demonstration lessons given in their classrooms, assessment of specific reading needs, and special assistance in developing and using appropriate instructional materials. As a consequence of their own growing enthusiasm about and involvement in reading instruction and spurred on by the effective catalytic action of the consultant, teachers in a wide variety of areas have developed and adopted a large number of alternative innovative approaches to reading instruction.

How has it worked out?

Evaluation of a program such as the one underway at U-High is difficult. One can look at the cold, hard facts of the reading scores. Actually they have advanced from the 89th percentile to the 92nd percentile. Furthermore, the imbalance between the vocabulary scores and the scores in speed and comprehension has become less marked. But, in addition to improvement in the standardized reading score, U-High has three other broad objectives: wide involvement of teachers in every content area teaching reading, students who use reading effectively to gain information, and students who turn to reading for enjoyment.

To judge the attainment of our first broad objective, use as data the presentations of our subject matter specialists which follow. Keep in mind that three out of every four teachers at U-High who teach "reading subjects" have made some contribution to the reading effort.

Assessment of the other two objectives has not been easily accomplished. No published tests are available which measure how well students read to gain information in specific courses. Furthermore, correlations between scores on standardized reading tests and reading achievement in specific subject areas are not high. The reading power of a student may differ markedly from one discipline to another.

Not to be overcome by this deficiency, University High School social studies teachers are beginning to construct their own test based on actual course materials. Teachers simply ask students to read a primary source selection typical of those to be assigned and then to perform a few sample tasks of the type that would confront them all year: selecting and expressing the main idea, grasping clearly expressed details, grasping unwritten meanings, drawing sound conclusions, and making deep interpretations.

Results of the test are quickly recorded on a Reading Needs Chart for each class. A check mark indicates a special need. A glance down the chart reveals instruction needed by the entire class. A glance across it reveals special help needed by individuals. The teachers plan a matching test on another document approximately equal to the first in difficulty. Through such a test, teachers can make a before-and-after comparison of the competencies of the class and of individuals.

Efforts to measure change in attitudes toward reading present special problems. However, students do respond willingly to a before-and-after questionnaire, "Please Tell Us," which contains questions about the amount of time the student devotes to reading, the extent of his reading during the past vacation period, and his likes and dislikes about subjects at school which require reading. The librarians also contribute their insights into the students' attitudes.

Day-to-day observation provides excellent evaluative data that many people overlook. These data are quite valid and provide an index to what is actually happening in a school. Some day-to-day observations of teacher behavior at U-High follow:

1. A science teacher teaches his classes how to read laboratory procedures independently. He has transformed many of his students into independent learners in this area, and his laboratory sessions are models of efficiency.
2. A number of our teachers, as individuals and in groups, write articles for leading professional journals about their reading improvement projects.
3. A young teacher, previously not fully aware of reading diversity, pores over the reading achievement of his students and then prepares a list of science biographies with reading level requirements indicated for each reference.
4. Carts are seen trundling books from the elementary school library to the high school building to be used by readers in need of lower-level materials.
5. As students approach the mythology unit (and other units), an English teacher assembles a classroom library containing something that *every* student can use.
6. The art teacher and others who have classroom libraries ask that reading difficulty be coded in all the books.
7. A teacher of the history of music, dissatisfied with one textbook for all, makes an exhaustive search through music libraries to find textbooks and reference materials which the weakest of his students can read successfully.

We recognize the preceding observations as limited, but when sufficiently replicated—and they have been replicated countless times—these data do provide an assessment of teacher behavior.

Is an all-school commitment desirable to a successful reading program? If so, how does such a commitment develop?

The answer is an unqualified *yes*! But then one must immediately define "all-school commitment" and "successful reading program." It would be untrue to report that every teacher in the

University of Chicago Laboratory High School views himself as a teacher of reading. Furthermore, it would be an unfair commentary both on the reading consultant and the vast number of U-High teachers who are engaged in the reading program to label it as unsuccessful. Thus, in the confusion of definition, in the inability to gain perfection from imperfect human beings, therein lies the true answer to the question. A reading consultant who begins work in a school cannot hope to immediately garner all or even a majority of the teachers into a reading program, especially if he works with the teachers in the manner we feel is appropriate, and also especially if he wants this program to last and become more intense and effective as the years wear on. Nevertheless, his goal should be "every teacher a competent teacher of reading in his content area."

In the same vein, the consultant cannot expect each teacher who becomes interested in teaching reading in his area to develop immediate competence. Teachers often need help in developing materials and techniques for teaching reading in their content areas. These materials and techniques must often be created jointly by the teacher and the consultant. The consultant can give enormous amounts of technical assistance—even helping to do much of the layout work and, with inexperienced teachers, sometimes doing some initial teaching in the classroom. But, the consultant must always keep clearly in mind what his role is so that the teacher finally emerges as a competent teacher of reading in his content area.

In my view, *one* teacher's upgrading reading effectively in his content area, when he did not or could not do so before, is success and makes the effort worthwhile. For, as we have found out, one successful teacher breeds another and another. As the years pass, if the consultant exercises his role wisely, substantial schoolwide commitment is created.

What is the role of the administrator in the development of such a program?

In his letter inviting me to participate in the day-long marathon about the reading program at the University High School, H. Alan Robinson described me as "The one high school administrator I know in the nation who guided a high school reading program to the point where reading projects are now flourishing in every discipline from English through physical education." When I read that statement, I looked again at the address to determine if I had received someone else's mail. Then I realized that perhaps Robinson had said it wrong. What he should have said was that I was a high school administrator who had the winning combination of an excellent faculty and a competent reading consultant and who didn't get in the way and "foul up the works."

Be that as it may, I want to present some insights into how Reading Consultant Ellen Lamar Thomas, the faculty, and I worked together on this reading program. First of all, let me say that Miss Thomas was a perfect choice for our school and for me. I believe in self-determination. I believe the best way to get a teacher to do his best is to give him the challenge and the room to meet it. I saw my role at U-High as completely congruous with the Harper tradition. In 1892 in a statement to Rockefeller, President Harper said that as he put together the University of Chicago his goal was to select the best people and let them come to Chicago and do what they felt needed to be done. Harper was a catalyst. As an administrator, I am a catalyst. As a reading consultant, Miss Thomas is a catalyst.

I have been asked to answer these questions, "How did it happen that you supported the program staunchly? How can reading people win the support of their administrator?" Miss Thomas never came to me with just the problems. To be sure, she brought many problems, but she always also brought alternative solutions. She respected my time; she came prepared to seek my advice; she always listened, but she never agreed to an idea if she could not support it. Her motives were clear; her programs, well thought out; yet she was flexible. She came for a conference at least once in three months. Sometimes she asked, "If you could turn me in a certain direction, what would it be?"

In addition, Miss Thomas is thrifty. In spite of the fact that her collection of materials is undoubtedly one of the best in the country, many of the materials are teacher made; many have been donated by publishers. Money is always a problem for administrators, and Miss Thomas knows it. I'll never forget the day she brought a problem to me which could only be solved with money. As I listened, I imagined a need for hundreds of dollars. When I finally got up the courage to ask her how much she needed, she said $50. Miss Thomas can stretch a dollar farther than anyone I know. She informed me fully about the program; I knew what our reading dollars were bringing U-High.

Moreover, Miss Thomas can teach and loves to teach reading. She generally taught a few students; her results were usually excellent. Therefore, I knew Miss Thomas was "for real." I never had to defend her work to anyone.

Finally, but perhaps foremost, the reading program at U-High has gone forward because the consultant has been just that to the teachers. She has never coerced or ordered. She has always been available and helpful. She recognizes the superb quality of the teachers and respects their ideas. Furthermore, when a teacher asks for help, she gets it fully and completely, and that help continues until every smidgeon of the need is satisfied. The help is warm and generous, never given begrudgingly. Whenever time or materials are limited, Miss Thomas levels with the teachers. She promises only what she can do, and she keeps her promises. In treating me and her other colleagues like that she won our respect and received like treatment. I know there are some pretty hard-nosed administrators around, but I doubt that anyone could resist giving Miss Thomas the support she needs.

What I have been trying to describe, I honestly feel is the miracle that can happen in education when a staff works together on problems in such a manner that each individual maintains and enhances his dignity and respect, improves his abilities, and enjoys some measure of success.

The pace at which knowledge is growing and changing is so rapid, much of the education we give students will go out of date within their lifetimes. They will need to update the education we give them for their careers. They will need to reeducate themselves for careers not yet in existence. What can we give them more useful than power in reading?

The Role of the Reading Consultant

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THIS PAPER answers the following questions about the role of the reading consultant in the University of Chicago Laboratory High School:

> What is your role in your school?
> How do you work with content area teachers?
> As your program developed, in what different ways have you come to serve teachers?
> Do you really have a reading-oriented school?
> What are your frustrations and failures?
> What are your hopes for the future?

As I describe my work, I do not mean necessarily to suggest our ways of working together or our materials for all other schools. In a different situation, other materials and procedures may be more effective. I hope the results of our efforts will be suggestive for different situations. The program described is developmental and corrective, not remedial. The University of Chicago Reading Clinic serves severely retarded readers.

What is your role in your school?

I came to the Laboratory School eight years ago. The school had decided to add a person in reading. No one knew quite what I would do. I was to work with a few students and try to draw teachers into a schoolwide effort.

On the train—all the way across five states—I made plans. There would be an "instant all-school drive" for better study; I had read about such drives in books. There would be "instant demonstrations" on reading in the content areas. Whole departments—the whole faculty—would attend.

My plans lasted exactly one day, and then I had a conference with the principal about my job. I was there to help teachers "if and when they asked" and not to "intrude" or "tell them what to do." Something is very precious in the Laboratory School and jealously guarded. It is each teacher's classroom autonomy. Dr. Congreve said, "When teachers are ready, they'll come to you. There are subtle ways to make them want to." I was to be consulted, then.

With this "lie-very-low" policy, did anything happen? Weeks passed. I was in my office—not rushing in, available on request, burning candles at altars, praying to be consulted, longing for home. I looked at the school reading scores and wondered why I was there: average IQ, 128, average student reading at the 89th national percentile.

Then one day a teacher sent Carole to me. "She studies night after night until midnight. Please help her study faster." Carole brought along her assignment, a book on Stone Age weapons so advanced and so technical that only a professional archeologist could read it. Girl and assignment were hopelessly apart. Soon other troubled readers came with Adam Smith's *Wealth of Nations,* having commentary intended for students at Yale.

Some teachers—especially new teachers—were thinking, "This is the Lab School. My students can all do college reading." Actually there was a full seven-year range at each grade level. Perhaps, after all, I had a reason for being.

Could there be a quiet "drive" to report this range in the hope that some teachers would make adjustments? We went into the "Reading Score-Kit" business. A personalized score kit was placed in the hands of the teacher, if he requested one. In the kit was a card for each student containing all test scores (from the guidance department's annual spring testing) that threw light on reading strengths and weaknesses. Our research director made a conversion scale to convert percentiles on the Cooperative Reading Test into grade levels. That Bob, a sophomore, scored around the level of our average sixth grader seemed far more eloquent to a classroom teacher than a percentile.

We tried to make the cards so handy, so convenient, that teachers could not resist using them. A science teacher received slightly different test information from that of an English teacher, as did teachers of social studies and mathematics. The teachers of each subject told us just what information they would like to have on their cards. On separate cards, we pulled out for each teacher the names of his students who might have special needs in vocabulary, comprehension, and speed. Lest the scores be misinterpreted, we delivered the packets in person and gave a careful interpretation. Of course, there were appropriate cautions. Teachers could regard the scores as only a hint of the level at which the student could handle most materials. A student should not be typed as being locked forever on a certain level.

(If I have been saying *we* instead of *I*, it is because I have been fortunate enough to have the assistance of an intern reading consultant, part of the program for the training of reading consultants at the University of Chicago.)

How else to quietly shout the reading range? Posters with a stick figure representing each student went along to meetings. Teachers of sophomores, for example, saw their students spread out from Laboratory School sixth grade level to above senior level.

Was there still another way? Teachers the school over were given class reading placement sheets. These showed at a glance the spread of reading scores within each class—from freshman through senior—and the distribution of students scoring on each grade level. We hoped these spread sheets would be a reminder, as teachers planned reading lists, to offer enough choices and enough copies on the lower levels.

Last fall we brought the class placement sheets even closer to the individual teacher. The sheet, already indicated the spread of this year's entire senior class. We now superimposed the levels of the *individual teacher's* seniors. Dave, a new social studies teacher, saw tallies for the entire senior class in purple and those for his own seniors superimposed in red. The names of those who had scored lowest and also highest were written in.

You may be thinking, "Score kits, poster, spread sheets, you're saying the same thing to teachers over and over!"

Dr. Congreve told me to. He said, "You're like Zest. It's a dainty bar of soap that leaves a lady lingeringly fresh and fragrant—but only for twenty-four hours. Then Zest wears off. And it's all to do over again. Remindings must be applied frequently—just like Zest!"

We even took reading scores to U-High librarians. How could we give them fingertip information? We made an instant reading level file with a card for each student. A librarian could turn to this file while a child was waiting for a book and have, in an instant, a hint of his level. When students came crowding for books on Shakespeare's theater—some needing seventh grade materials, some capable of college reading—librarians could have their levels for instant use.

There was this plea over and over: "When poor readers are assigned readings years beyond them, they simply can't read them, they are overwhelmed, lose out on practice, and fall even farther behind." If readings can include some easier offerings, the poorest reader has some chance to practice reading. The ideal is a sequence of increasingly difficult readings with the student held to all he can do. And our best should be challenged, or we leave these gifted students standing still.

In all these varied ways (score kits, posters, spread sheets) we tried to translate impersonal black and white percentiles into the personal needs of students.

I had begun to see a reason for being when Carole brought her assignment on Stone Age weapons. But in my office I was still a "lonely heart," still praying to feel needed as I had back home.

How did you come to work with content area teachers?

Do you have any way of inviting requests? Do you just wait for requests to come to you? How did you get the program going? How do you keep it going?

First, we offer our services to new teachers. We don't meet them at the airport with reading—not quite. But they have hardly unpacked their suitcases before we greet them with it at U-High. It was the principal's custom on the very first day of preschool to meet with the new teachers. It was his suggestion one year that part of this meeting time be given to reading. We acquainted newcomers with our broad range in reading achievement. We quoted statements of highly respected faculty members:

> The chairman of social studies: "They scoot over new words. They try to get them entirely from context or ask in class."
> The chairman of the science department: "They make a whip-through of demanding reading."
> The chairman of the mathematics department: "Do these bright kids need to slow down for close, reflective reading? My gosh, yes!"

We offer a list of specific services. We also offer them a welcome present, their score kit with a card for each of their next Monday's students. They receive a take home folder with a letter to new teachers, the class reading placement sheets, and printed advertisements of our services.

Second, we advertise our services to all teachers. We go to meetings, advertise in the teachers' bulletin, and put flyers in mailboxes. At the beginning, if some department did not seem aware of us, we prepared a special flyer for that department, a leaflet on "Services of the Reading Consultant for Social Studies," etc. Does interest develop from all this advertising? Sometimes, but not nearly often enough.

Third, we set out deliberately to draw out a teacher's deepest concerns. This way proves the most effective. We prowl the halls and offices and talk with teachers. We often lead off with this question, "What bothers you most about the reading of your students?" Miss Haehn, typewriting, answered: "They read directions in the typing textbook superficially. It's the major block to their progress in typing." We asked, "May we look that book over? Maybe we can think of a way to help." We returned soon and laid possibilities before the teacher: "Do you think it might help if we did this or this?"

Once in a while a friendship with a teacher "just happened." That was "Serendipity Day!" Mr. Muelder told me, walking up the stairs, how he was already working with his mathematics classes in reading the textbook. I asked, "May I visit some day?" Bob Erickson, art, invited me to visit his art class book collection, begun long ago in 1943. It was "Serendipity Day" when we visited Dorothy in home economics and found her carefully preteaching the meaning of the word *collander,* while surrounded with chopped onions, tomato sauce, and Parmesan cheese as her classes were making spaghetti.

Fourth, we try to invite requests by meeting those we receive promptly and well. I had audited H. Alan Robinson's course on the work of the consultant. He had stressed over and over, "A prompt response says to a teacher that his request is valued." We found that instant or one-day service with brief favors was often possible. A request well met might lead to another.

Someone may be thinking, "First, you advertise; then you go from teacher to teacher probing for their concerns. Aren't important areas still overlooked?"

I had been counseled, "Don't be intrusive." But as time passed—and this is the fifth and last way of inviting requests—I found that I could go freely to many people with suggestions. To the English chairman: "May we try to draw all of your teachers into a schoolwide vocabulary effort?" To next year's chairman of the science department: "Would your teachers like a project on what to do when students 'just can't get' their science reading?"

As your program developed, in what different ways have you come to serve teachers?

We have mentioned the *first* of our ten services. We place standardized test results in convenient form right in the hands of teachers. *Second,* a natural outgrowth, we help teachers search out materials for students' reading on a wide diversity of levels.

Often we do the latter with standard book lists. A history teacher asked, "How can I learn the range of books in print for high school use in United States history?" An English teacher queried, "Can you find good quality novels within the reach of my less able readers?" Both of these teachers were supplied with annotated book-size booklists to keep on hand.

For English teachers who wished to match mythology books to students, we trundled carts of books from the elementary library to stock their classroom bookshelves. Their top students were challenged by Gayley and their poorest could handle *Story of the Gods and Heroes.*

Teachers considering the use of certain books began to ask, "What is the difficulty level of this book? Is it appropriate for these students?" We applied readability formulas for the limited help they could give, then examined the book and added our informal comments.

Third, we help groups of teachers work to upgrade reading. "Don't rush in and tell our teachers what to do," our principal had counseled the first day.

One day the chairman of the sophomore teachers asked, "How can *all* my teachers in *all* their different classrooms help *all* our sophomores become better readers?" Using moments at the mailboxes, in the hall, over coffee, or under the dryer at the beauty salon, I asked each teacher, "What are your concerns about the reading of your sophomores?" and "What are your own methods of meeting these needs?"

There was much sharing, adding my own ideas, and compiling. In meetings, this was the approach: "How can you work toward better reading? You are already doing it. Here are your best ideas, with added ones of mine." The reaction of some teachers was "But we can do more!" As ideas multiplied, the sophomore teachers and I wrote an article, "How Teachers Can Help Toward Better Reading" (*2*).

The time spent in interviewing was my delight and a luxury permitted by my school. Perhaps, elsewhere, the teachers could have submitted their best ideas very quickly in writing.

Soon the chairman of the social studies department inquired, "How can we avoid overwhelming poor readers?" Again I interviewed the entire department, drew out their ideas, added my own, and offered the suggestions back to the department as an idea exchange. Another magazine article resulted, all the teachers contributing practical solutions (*5*).

I have had three secret hopes in these articles:

1. That by appreciating what teachers were already doing, I would encourage them to continue.
2. That as the nearly finished article went the rounds of all the teachers for their approval, each would learn the best ideas of all the others.

3. That after teachers had subscribed to an article, signed it and published it, they would be lifelong crusaders with fervor to do even more with reading.

One day during a lull (lulls were *not* frequent now), my intern queried social studies teachers, "Can we possibly help you next fall?" Teachers of seniors answered, "Yes! Help our students read the documents of 1607." In May, these teachers and I planned sessions for the following October. Using the actual documents, we developed transparencies. When October came, the consultant visited each senior class twice with how-to-do-it sessions. The teachers planned reinforcement.

Fourth, we help individual teachers upgrade their students' reading. A young English teacher with no training in remedial reading observed in her seventh graders a need for word attack skills. One day she asked, "Can anyone with my background learn to teach phonics?"

How could we help her diagnose needs, and teach her to teach word attack skills? How could we help her provide materials not too juvenile for seventh graders? We prepared a word attack kit. In it we placed tests to diagnose the needs of a class, profiles for recording the needs of individuals, and practice materials for teaching many phonic and structural skills (hard and soft *c,* dipthongs like *oi,* syllable division). Practice exercises were torn from various workbooks and coded by grade level in the upper corner. We chose materials from Grade 4 through Grade 10; we rejected workbook pages that looked juvenile. As a timesaver, this kit is heaven sent. If a student or group is having trouble with the sounds of *c,* for example, it is possible to find, within seconds, practice work on just the right level.

But how could a young, inexperienced teacher quickly learn how to teach word attack skills? *The box itself teaches the teacher.* Sound teacher manuals were placed in the box. Recorded in an upper corner of each workbook page were the initials of the corresponding manual. A teacher without the faintest idea how to teach hard and soft *c* could refer from the practice exercises to the corresponding manual and receive sound instruction.

When working with a group with a common need, this young teacher referred to the kit and then dittoed her own practice materials. When working with an individual, she placed the appropriate practice exercise in a plastic envelope, and the student wrote on the plastic with a china marker. Thus, the materials were reusable.

We had conferences with the teacher: first, on the test results, and, then, on the use of the kit.

Preparing such a kit may look formidable. The hardest part was deciding on the categories of skills. The lists of skills in standard workbooks helped. While this box is elaborate, a simpler, very useful box can be made in an evening.

Reading teachers back home in Florida, where I'd taught for a number of years, made devices like the word attack kit on inservice days. Someone made a model and ordered all the materials that would be needed. Those who were interested, gathered, worked all day, and had a great treasure to take to school the next day.

We hoped the kit would be a sound investment of our time and effort, that it would add to a young teacher's resources and strengthen her present and future students.

Dave, the first year social studies teacher, had requested his "welcome present," his kit of reading scores. Then he thought of something else. "My seniors are starting a very difficult book on the history of political parties. How can I help them read it?" We borrowed the book, studied the blocks that confronted his students, and then returned with possible helps. Lest we overwhelm a first-year teacher, we placed the tips in separate folders, each with a manageable amount of reading lore—"How a Social Studies Teacher Can Help *Before* His Students Start a Reading Assignment," "What Students Can Do if They 'Just Can't Get It,' " and others. We had a conference on the folders and then left them with Dave to be used whenever needed.

Fifth, we make classroom visits to work on reading improvement along with the classroom teacher. These visits are always planned with the teacher beforehand. There is almost always an exchange of knowledge, the consultant learning from the content area expert and the classroom teacher acquiring insights about reading. Such was the case when the chemistry teacher suggested a visit.

A few weeks before, this teacher had asked, "Can you give Jon some reading lessons by himself? He doesn't get what he should from his chemistry textbook." I was in a panic over helping with chemistry. No one was more surprised than I when Jon improved, moved up to a *B,* and made *B's* ever after.

Then the teacher, pleased about Jon, asked, "What did you do? Let's do it for all the students in September." Together we worked out a "how-to-read-your-textbook" session, adapting PQRST* to the chemistry textbook. Our session in the fall was a team effort. The consultant suggested general procedures for each step—preview, question, and so on. Then the chemistry teacher demonstrated how to carry out that step with the chapter assigned.

Sixth, we often create *with* teachers materials for giving instruction, materials tailored to the needs teachers observed in their students. We had asked teachers, "What bothers you most about your students' reading?" Mr. Tirro had answered: "Something's the matter with their reading in music harmony." Mr. Ferguson: "They need desperately to improve their reading of laboratory procedures." Mrs. Symkowicz: "They need to read a recipe and the directions on package mixes." From harmony of music to package mixes! How could a reading person feel any confidence or *hope* to be helpful?

If from our varying ways of working together a pattern emerges, it is something like this:

First, I explore the need with the teacher. "How do your students fall short in this kind of reading? What ideas do you already have for meeting these needs?" Then I inquire, "What chapter or what part of the textbook is appropriate for giving some instruction?" At that point I retire into complete seclusion and study everything I can find in the reading literature. Then, in unhurried talks together, the teacher and I plan the instruction and the materials. I try to free the teacher of the burden of the mechanical details and sometimes of much of the writing. I am underfoot constantly, laying possibilities before the teacher, and asking, "Do you think this would help?" And I am underfoot again to ask a final blessing.

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* PQRST is a study procedure very much like Francis Robinson's Survey Q3R. The *P* refers to Preview, the *Q* to Question, the *R* to Read, the *S* to State, and the *T* to Test. Detailed information may be found in Staton (*3*).

Let me give you an example. One spring, five geometry teachers and I worked on materials to improve the reading of the geometry textbook. These books were to be used the following fall. My intern and I drew out each teacher's insights: "Why does geometry call for new reading approaches? How do you help students master difficult technical terms? How should they approach the pages and pages of expository reading? How do you help them read diagrams? How do you encourage an appropriate speed? How do you help them read theorems?"

The best ideas of the five geometry teachers, with many added ideas of mine, were compiled into a comprehensive section for students' notebooks. The exchange of knowledge between experienced teachers and the consultant strengthened each and seemed priceless.

Could this exchange occur with less competent teachers or with young, new teachers? It has usually been possible to draw and incorporate *some* contribution from each teacher so that the final product is at least partly his. And the one who contributes *least* is exposed to all the ideas that have proved effective with all the others.

The *seventh* way of serving is the building of procedures for helping with reading skills right into the courses of study. Scores in vocabulary were trailing and the English Department rose to that need and incorporated vocabulary activities into the English curriculum. We have just revised these in a booklet, "A Program for Vocabulary Development" (*1*). In this booklet are the favorite vocabulary ideas of each of our English teachers. Again, I was the interviewer and compiler. Trying not to place an added load on a far too busy English teacher, we tried instead to suggest ways to develop vocabulary in the day-to-day work of classes through the regular course materials.

We wanted, if possible, to counteract the rapid turnover of our faculty with the resulting loss of strength as teachers leave our school. Here are the precious insights of teachers with years of Laboratory School experience to be passed on through this booklet to young incoming teachers.

We produced another booklet for English teachers, "A Program for Speed Adjustment" (*4*). We suggested ways to develop speed adjustment in the regular work of classes through the regular course materials.

Eighth, we offer the school a reading resource center. We assembled a collection of commercial materials quickly. But often these were not exactly right. So over the years we developed a collection of home grown products—materials custom tailored to the needs of our school. Teachers are encouraged to borrow freely.

We made a few tapes of teachers working on reading within their classrooms. A young mathematics teacher, if he likes, can turn on a taped lesson of an experienced colleague working with his class on reading the mathematics textbook.

A few professional books and useful research findings are in the center and many more are just a step away in the university library.

The *ninth* service is that the reading consultant is responsible for the soundness of the school's program. Someone has said, "Ulysses was lucky. He had sirens luring him from only one rock." In the field of reading there are jagged rocks and sirens everywhere, and the consultant must guide the school safely past the sirens to a sound program. One of the most enticing sirens is always speed reading. When U-High teachers were polled informally concerning the special needs of their students, their most frequent answer was "Our students need speed adjustment. Especially do our bright, perhaps overconfident, students need to develop a close, reflective approach to reading." Science teachers observed that many read their science "like a novel." University High is driving not for indiscriminate speed but for day-to-day instruction and reinforcement within the classroom on how and when to skim, how and when to do rapid reading, and especially how and when to do slow, intensive reading. When special training to improve rate of reading is in order for individual students, it is provided through the reading clinic. Making speed the end-all, some commercial enterprises will gladly take over a school's reading program. The consultant is available to support a school in resisting such pressures.

We have mentioned that the University of Chicago Reading Clinic serves the Laboratory School. There a clinician instructs our retarded readers. Our *tenth* offering is liaison service. We are the pony express between the Laboratory School and the reading clinic. We assist teachers in making referrals. When they ask, "Which students should I refer?" we provide specific guidelines. For some years we have written a letter about each student enrolled in the clinic to each of his content area teachers and to librarians. We want to enlist his classroom teachers in the rescue operation to give them some idea of the level at which the student is capable of reading, to alert them to his special needs, and to encourage them to recognize and praise small successes.

Aren't you materials-happy? You generate so many.

Many of our projects were first efforts. A classroom teacher with a completely new reading project seemed to appreciate materials to lean on. Then, too, we hoped the project would continue year after year. We printed materials in quantities and left quantities in the hands of the teacher. We hope these materials, on hand for the future and easing the way, encourage the teacher to continue another year.

Isn't your school favored above others?

That much is ideal is apparent—our testing program, our print shop, these superior teachers. We have mentioned, however, the wide reading range below our fair appearing surface. But, in addition, we have a turnover of faculty members devastating to the growth of a reading program. Our teachers prove tempting to other schools and are lured away from us. When school bells ring each fall, many of last year's teachers are no longer with us; they have taken their interest in reading out of our school and away from our students. Then there's much to do over again with another crop of teachers.

What do you have here? A finished product? A model reading-oriented school? A success story?

All teachers are not involved. Interest is uneven throughout our school. If our program has a touch of uniqueness, it is proving that teachers in every discipline can be involved and active.

They do not ask, "Isn't that the English teacher's job?" or "Why didn't students learn to read on a lower level?" Each is aware both that in his course the student may meet patterns of writing never before encountered—the laboratory manual, the typing practice book, harmony of music, a geometry theorem, a sewing pattern—and that nowhere in all his years at school has the student had a chance to learn to cope with these types of reading.

Classroom teachers must add a skill or two at a time to their competencies in improving reading. Most of these teachers do not consider themselves experts in teaching reading in their content areas. In high school reading where much is uncharted, they are gradually working out ways to teach *some* of the readings skills of their subjects. Our projects are in various stages, as you would expect in a school—some in the planning stage and others proved and refined.

To sum it up, at this stage a truly schoolwide reading program at University High isn't the dream fulfilled and it isn't Don Quixote's "impossible dream" either.

What are your frustrations and failures?

There are success days and also failure days. The visit to the chemistry class, though sound enough in planning, went all wrong. The Lab School's top science students had their own effective methods. Some were junior Einsteins and couldn't care less about our pointers. Perhaps we should have selected those who felt some need. Sometimes a teacher hands out our materials without a word of instruction and expects the materials to do the teaching. There's a chance that some of the English teachers who received the booklets on vocabulary and speed adjustment have yet to look inside them. Dr. Congreve would remind me of Zest, its delicate fragrance fading. We must try anew and remind and reapply Zest every twenty-four hours.

I am encouraged by teachers like those who have contributed to this volume—who have learned with me, taught me, inspired me, and kept me going on my failure days.

What are your hopes for the future?

First, we'd like to create tests far more revealing than standardized tests. We're planning informal testing using student's actual course materials, starting in science. We hope this type of testing will catch on all through the school.

Second, we hope to build help with reading skills right into the courses of study in more and more disciplines. We have already prepared booklets for English teachers on vocabulary and speed adjustment. Missing is one on comprehension. We hope to have it ready shortly. I am now working with science teachers on a booklet about how to improve reading in the day-to-day work of science classes and hoping this will be worth including in the course of study. We hope also to develop something that has never before existed—a music course of study with reading skills built in.

Teachers at University High School are trailblazing in secondary school reading instruction. We've plunged into the woods, made marks on trees, blazed a few paths, been lost at times, and then sometimes found our way again. A New England poet, referring to woods in quite a different context, wrote "the woods are lovely, dark and deep . . . and miles to go before I sleep." We'll continue working in our school—in our woods—with miles more to go in our program.

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Home Economics and Reading

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IN A PRACTICAL AREA such as home economics, reading not only has to be comprehended but has to be followed by action. This action proves whether the words have been interpreted correctly or whether the words were merely glanced over or left out completely. Some students read one or two words and guess the rest. Such weakness or carelessness in reading is disastrous to obtaining a successful product.

Special guidance from the teacher is necessary in reading directions followed by action. In order to carry out this type of guidance, our reading consultant and I have developed three sets of guidelines, mainly for beginning students. First, we produced "Guidelines on How to Read a Sewing Pattern." The word *pattern* means the commercial patterns available for making clothes—the cutting pattern and sewing guide. Anyone who looks at this material for the first time is struck by the complexity of the whole set up, so it is easy to imagine how difficult it must appear to a beginning student.

Careful preparation should precede the reader's first attempt to follow a sewing guide. The guide is written in a language all its own; it contains familiar words having different meanings and unfamiliar words with no known meaning. For example, one girl was asked the meaning of "bias." She said "prejudice"—a good answer in one sense but not in sewing where bias has a completely different meaning.

In order to solve a problem, many students tend to look for the easiest and fastest way to obtain the information or learn a new technique. Questioning a teacher and getting all the answers that way are common methods, if students learn to get away with it. Looking up information in a sewing resource book on one's own initiative is practically unheard of. Since I was eager to have students learn independently, I needed to help them understand and interpret the terminology of the sewing guide. Stress was also needed on the easy location and familiarity with sewing resource books in order to find explanations of unknown terms and to gain more specific information.

The guidelines on how to read a sewing pattern were introduced with these purposes in mind. But in order to learn to use the guidelines effectively and efficiently, teacher and student have to study and read together each section in conjunction with the sewing guide while referring when necessary to the location and contents of a sewing resource book. This preliminary study tends to arouse a curiosity and excitement for the beginning student; new techniques become easier, resulting in more satisfactory projects. Both teacher and student time are used more efficiently.

The second guidelines developed were "Direct Success with Directions on Package Mixes." The term *package mix* can refer to any package that contains directions on the outside for the use of the contents. It can apply to both food and nonfood products, although in this case food products were used since they seemed to present difficulties to students. The attitude the students displayed toward package mixes was one of overconfidence—an easy project with a perfect result. I have noticed that many adults tend to have the same attitude. Advertisements which state that package mixes are easy and will always work out perfectly fail to emphasize that the directions must be followed exactly step by step if a perfect result is to follow. If anything is wrong, the student tends to blame the contents of the mix without realizing the fault may lie in his interpretation of the directions.

Experiments were carried out in class with seventh and eighth graders using package mixes. The results were quite unexpected and extremely interesting from many points of view.

Here is an example of such an experiment: To familiarize the students with the necessary techniques, students made a food product from a regular recipe using normal lesson procedures. The same students were then given a package mix making the same product. They were only told to follow the directions on the package. Such remarks as "that's easy" and "no challenge in that" were audible before work was begun. The students observed during the preparation of the food product seemed to pay very little attention to the directions. They merely glanced at the directions now and again or asked one another what to do next. Some students never once looked at the written directions. As the activity developed with varied procedures and the use of an assortment of equipment, students were beginning to look completely lost. For many the final step was guessed and the concoction was thrown into the baking pan in utter despair. Some ovens were not checked for the correct temperature; one oven was quite cold. Most students, expecting as good a product as the first one they had made from the regular recipe under normal teaching procedures, were very disappointed in the results. This one, alas, was a sad looking second best. Then students tried to reassure one another that it did not matter how the product looked so long as it tasted good. The conclusion of the group, to their own surprise, was that they had misjudged the mix and it was easier to make the product "from scratch."

The guidelines on "Direct Success with Directions on Package Mixes" were used with the same group of students and were read slowly in conjunction with another set of directions on a package mix. Quite a lengthy discussion followed until everyone felt ready and well prepared to tackle the mix (a different product). Again I overheard the students say, "this time will really be easy," and indeed they looked more confident. The directions were read several times with the care and other necessary emphases explained in the guidelines. Students, on the whole, carried out step-by-step procedures with much better results. There were still some difficulties, but this time they were not necessarily reading problems. A couple of students became overconfident after reading and performed carelessly. Obviously, reading skills are not enough to insure a perfect job; practical skills are needed as well.

The third guidelines, "How to Read a Recipe Successfully," have been in constant use by students. The format of these guidelines is like that used in other content areas in our school. In fact, one student said to me, as she glanced at the guidelines for the first time, "I've done this in biology." Obviously, transfer of training was being recognized and probably utilized.

The guidelines have been tried out in several ways. After much experimentation, I found that students responded best to a guided lesson—reading the guidelines, followed by a discussion of the meaning of terms, punctuation, and specific steps in the reading of directions. Then the guidelines were inserted into the students' notebooks and were easily available for future reference. When regular recipes were used afterwards, students read them with clearer understanding and more meaningful action.

What are the long range values?

Success in home economics helps a student to become creative, to organize oneself, and to create a deep inner satisfaction. In a highly academic and competitive school, such as our Laboratory School, practical accomplishments tend to have a therapeutic effect on students by reducing tension. None of this is possible if the student is basically unable to follow directions. The three sets of guidelines are aids in following different types of directions—a sewing pattern, a package mix, and a recipe. After the initial steps are understood and accomplished, there is no limit to progress and creativity. Students become more independent and confident in themselves. After school days are over, the girls should be able to continue to sew without professional help because they can enthusiastically follow patterns without frustration.

Following directions on packages is becoming more and more necessary as the quantity of items increases. It could be said that this is "the age of directions." I can foresee the time when nearly everything available will be prepackaged—with directions. Even today there are very few commodities without some type of directions attached. The concise way that directions are written requires slow, precise, and careful reading. People tend to become overconfident when they see very short and concise directions; this attitude seems to be a very common failure leading to limited understanding.

Value in following recipes successfully means more confidence in trying out new ideas and following any recipe in a cookbook. Although the guidelines on how to read a recipe were developed mainly for the use of Grades 7-8, now I find that Grades 9-12 are careless in the interpretation of a recipe; so I have started to use guidelines at these levels as well. One punctuation mark can mean the difference between failure and success.

The usefulness of any guidelines must be reinforced at all times by referring to them at every opportunity with accurate consistency. The one-shot lesson attitude with no follow up has very little value with these guidelines. Since working on them, I have become much more alert to the many different types of directions and the different formats used for writing and illustrating them. I also seem to hear more people complaining of silly mistakes in following directions or recipes. Or perhaps I have just become more aware of problems with the reading of directions. Or it could be that many of my students and friends know of this project and are not so shy about sharing their mistakes.

The very fact that Miss Thomas, our reading consultant, took the time and attached enough importance to visit my class and discovered the potential in reading in home economics made me realize the value of having a good reading consultant in a school. She gave me the initiative and confidence to develop and pursue special reading skills. I have had so much fun in sharing my thoughts with her and discussing problems common to our areas. My outlook has been considerably broadened by her help. She has willingly and patiently listened to my class discussions, thereby encouraging me to continue trying harder to find newer and better methods.

Reading Skills and French

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I HAD KNOWN our reading consultant, Ellen Thomas, for about three years at the Lab School. One day after a rather frustrating experience with my French class in the area of reading for comprehension, I asked Miss Thomas if there were any techniques used for improving reading in English that might apply to developing reading in a foreign language. She hasn't stopped answering yet.

Readiness. Emphasis on getting students ready to read a particular selection in French improves classroom performance and participation. I use several techniques in providing readiness; e.g., if there is a short article on a province of France, say La Bretagne, I ask the students to list some question they might hope would be answered in the passage. What is the climate like? What customs are unique to the region? The task is to see how many of the questions might be answered and what other information is to be gained from the article. On the whole, the task is merely to develop areas of interest in the selection based on everyday life in other content studies.

Context clues. I'm sure that there are as many traditional approaches as there are modern or new approaches. The most important aspect of the emphasis on context clues is that reading for comprehension becomes a tool rather than an objective per se. The true objective is the gaining of knowledge through a different set of graphic symbols. It is important for the student to know that the goals of reading in French are really no different than the goals of reading in other content areas.

I was fortunate to have the services of a reading specialist who could emphasize developing context clue power. I'm sure that Miss Thomas would agree that the material she developed could be used effectively by the language teacher himself with very little inservice training. In other words, the package was developed for use inside our Lab School.

Study techniques. The purposes of reading selections in French may be as varied as those needed for the reading of any material. The essential and major goal is reading for comprehension. When the task is to read a passage thoroughly in order to retain information, PQRST can be helpful. Often PQRST can be combined with the steps mentioned previously in getting the student ready to read his assignment in French. In this way, some of the questions are already posed for the student. If, for example, the students are told that there will be a quiz testing the information contained in the reading selection, PQRST is certainly a useful tool in approaching the task.

As a student becomes surer of basic French words, and vocabulary is no longer a major hurdle, he may also be taught to develop flexibility in reading rate. When we first started to work on flexibility of rate, we introduced the concept too soon—before the student was ready in terms of vocabulary security. It seems best that, for most students, attention to flexibility be postponed until French 3.

Concluding remark. Attention to readiness, above all, and then study techniques emphasizing purposeful reading are valuable "reading" concepts for the foreign language teacher. The reading of a foreign language becomes more meaningful when there is deemphasis on decoding alone and great stress is placed on purposeful activity.

Let's Have a "Read-In" in Typewriting

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IF YOU WERE ever enrolled in a high school typewriting class, you probably are familiar with a popular practice sentence: The quick brown fox jumped over the lazy dog. Assuming that reading specialists are quick brown foxes, it is time for typing teachers to stop playing the role of the lazy dog. To these fellow typewriting teachers I have this message: "I like the teaching of reading skills. So will you. You will find it one of the most rewarding phases of teaching."

The reader may remember another practice sentence in typewriting: *Now is the time* for all good men to come to the aid of the party. *Now is also the time* for all good reading specialists to experiment and find ways to insure the greatest success for each person in developing and using the specialized reading tasks involved in typewriting.

How did the typewriting teacher at the University High School become interested in the reading habits of her students? Selfishly, I must confess that in the beginning it was the intense desire to cut the mileage on the red pencil route of paper correction. This desire developed into three reading projects. The first is upgrading the reading of the countless directions in the typewriting textbooks. From cover to cover, the textbook is little else but one set of directions after another. The second is teaching the student how to read straight copy—how to adjust his reading as he copies a passage from his textbook. This task demands of the student some new procedures drastically different from his usual reading habits; indeed, unique to typing classes. The third is developing reading skills for proofreading—skills often completely lacking in students.

September is the most beneficial time to create a typewriting "read-in"—a reading and typewriting environment. Typing is unique in the sense that most students enroll with a built-in enthusiasm. The motivation is keen to learn something new. Postponement until October or later may not only reduce the typist's readiness to learn but readiness may be replaced with apathy toward the subject. As the year progresses, through a series of planned steps, the students will get feedback on their ideas through discussion with their teacher and classmates. Hopefully, the typing teacher will get the students to say in their own way that the typing textbook is not easy, light reading but rather rough going in spots. Hopefully, too, students will realize that the development of reading skills will contribute to error-free typewriting.

Upgrading Directions

Coming to the Laboratory School my first September a few years ago was highly anticipated, for it would be an experience with the academically talented student. But as the year progressed, I noticed that even a top-notch class of 22 bright seniors was asking seemingly nonessential questions about directions. Many times I would have liked to answer these questions as one of my freshman boys answered a senior the other day: "Read the directions, stupid! It's *all* there." Why was I making the same red circles with these bright students? Perhaps these students were skimming the textbook directions.

Soon Miss Thomas examined our popular, widely used textbook. She found that the directions which confront students total more than 1,200. The students were made aware of this "directions explosion" by examining papers from my collection of folders from the previous three years. The students began to see a pattern of errors caused by the misreading of directions. Then, Miss Thomas and I decided to involve the classes in the task of developing their own guidelines. Somehow the student must be made to feel that the instructor is trying to help him, and is not imposing a reading program on him. Some students will tune you out very quickly if you allow the lecture to become your basic method of motivation. You must bridge the generation gap by involving the student.

In an approaching lesson, the students were to be confronted with the directions for aligning and typing over words, a complicated procedure involving a series of numbered steps. I involved each class by asking: "Suppose you wish to follow these directions without a word of help from your teacher. How would you go about reading them?" With their attention focused on how they would read the directions ideally, the students came up with some highly practical pointers. These I recorded in shorthand. The suggestions of the students were then combined with Miss Thomas's expertise. The resulting guidelines were projected on a screen for instruction and student comment. The final guidelines were printed as a foldout, which students kept for reference in their typing folders. The foldout was readily available when the instructor wished to conduct how-to-read-directions sessions for other practice problems in the textbook.

The students were next asked to examine four selected pages of their textbook. The helps the students discovered were then illustrated on a poster and displayed in the classroom.

These two materials, the foldout and the wall poster, *do not* teach by themselves. Teaching self-improvement skills in this area is not an instant course. They must be reinforced as time permits. Again, interaction is necessary.

After a few weeks, there was need for the students to assess their own skill in reading directions. Students were asked to write in their own words their need areas on an index card. In follow-up sessions each class discussed these need areas. Miss Thomas listened outside the door and took notes. From these we evolved a Self-Evaluation Check Sheet for Reading Directions. The students evaluated themselves at intervals.

This year, to dramatize the value of aids provided by the authors of the text, an "aid-less" page was projected on a screen. All the aids were blanked out. The search for helps on the poster pages had sharpened the students' awareness. When a textbook page with all the aids was flashed back on the screen, the typists realized the contrast.

This year the students contributed to a reading-typing bulletin board called the Goof Board. The particular direction printed in the textbook page was circled and displayed with a student's incorrect paper and the corrected paper. This display stimulated students to zero in on easy but easy-to-miss directions. The teacher hoped that the bulletin board would turn out *Thinking Typists* and not *Typing Robots.*

As the freshman boy said, "Read the directions, stupid. It's *all* there." It is *all* there. The typing teacher will have to help the student find out why his how-to-do-it insights have not developed into independent do-it-your-self techniques.

Reading Straight Copy

Our second reading project is developing a reading competency unique to typewriting—the reading of straight copy while students are typing a passage. The typewriting teacher stands with timer in hand for a timed writing and says, "Watch your copy, ready, 3-2-1, go!" But are the students really going in the right direction in their reading?

In my situation, I found my students were reading too fast. The average student will need to read straight copy far more slowly than he does his ordinary reading. Adjusting the reading rate downward will require conscious effort. The instruction, motivation, and reinforcement must be provided by the instructor.

Miss Thomas and I investigated techniques for reading copy and prepared, for students, ten techniques or tips in "How to Develop Proficiency Plus in Reading Copy." Included are ten techniques or tips used by world champion typists as they copied a passage. Students were involved by asking them to predict in advance the ten techniques. How did the champion typists read copy while attaining their fantastic speeds? Did they read it rapidly or slowly? With eyes on the immediate copy or far ahead? By taking in words by parts or wholes? With or without attention to what the page was saying? After receiving instruction, our students realized that here their purpose in reading was entirely different. They found that they did their ordinary reading for enjoyment or information and could become lost in the meaning. In straight copy they would be transferring what they read letter by letter, mark by mark, and space by space from the copy. Their purpose would no longer be getting meaning, it would be reproducing symbols. For example, becoming lost in the description of a beautiful sunset would probably cause them errors.

We taped the ten tips for eliminating errors in straight copy reading to the student's individual desk in order to sound an alert.

In view of the emphasis placed on five- and ten-minute straight copy typing tests required of most job applicants, it is of great value to equip students in search of jobs with these reading skills. Since these tests are administered under extremely distracting conditions and sometimes with poor equipment, why not help students by eliminating as much as possible the disability in reading copy? Why not teach them to type numbers in two's or three's so that their total test score will be increased?

When the typing teacher says, "3-2-1-, go!" are his students hung up in the reading of straight copy? If so, he is guiding groups of learners with machines. He could be guiding individual learners with machines in the more personalized terms of the discipline of reading.

Proofreading

Our third reading project is teaching effective techniques for proofreading. Proofreading to eliminate errors is an additional skill which must be taught in the typing class. Many students proofread carelessly or not at all. The ability to *find* errors is not enough. The student must *want* to find them.

Reading the latest professional journal on this skill has little use the next day unless the typing teacher can "sell" it to his students. The market is there, but the buyers are not eager. Laboratory students are the product of emphasis on the abstract. They dislike attention to detail. A typing course can be their first head-on collision with detail. They don't want to be bothered with it. Here are some of the remarks: "What difference does it make? You bother me too much with little things. I didn't take typing to learn English. I just want to learn to hit the keys fast." The role of the reading specialist, therefore, is to assist the typewriting teacher in communicating to his students the know-how of proofreading in terms they find relevant.

We asked our students: "What is your P.Q., your proofreading quotient? Are your papers returned with errors that you yourself could easily have eliminated?" We prepared for the students twelve tips guaranteed to add points to their P.Q. First, we involved the students by asking them to predict what professional proofreaders have to say about the most effective techniques for catching errors. Then, I instructed them in these techniques. This difficult skill cannot be merely discussed. It must be developed in a meaningful way. The twelve tips, taped to each student's desk, reminded students each day to watch their P.Q.

Is proofreading difficult? In an error-detecting test given to 1,000 business teachers at conventions, not one teacher was able to detect all of the 50 ordinary errors packed into a 150-word letter.

Is proofreading important? It is the difference between two letters on the keyboard. Let's take a *w* for a *t*, or the word *now* for *not*. A letter to the panel chairman stating, "The laboratory schools are not ready to participate in this convention," would have changed the course of events.

Of course, businessmen are concerned with the cost of poor proofreading. They often ask, "Why can't the beginning employee type well? Why can't he spell?" The answer is that many students never learn to proofread. Often business tolerates this shortcoming in a new employee. In a recent office-grooming survey regarding the wearing of miniskirts, 372 members responded. Fifty-two percent approved and 48 percent did not. One replied, "We allow miniskirts because we need all the help we can muster." The poor proofreader may be hired. His advancement, however, is not likely to be dramatic.

Your role is sharpening the teacher's communication with your know-how. With your help, the typewriting teacher can lift the P.Q. of his students.

In conclusion, these three concomitant learnings in reading directions, reading straight copy, and proofreading are not a substitute for operational efficiency at the machine. But they will contribute greatly to the total typewriting performance.

Now is the time for all good reading specialists to come to the aid of the typewriting teacher. Let's have a "read-in" in typewriting!

Reading in a Mathematics Class

RICHARD H. MUELDER
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FROM AMONG the various things a math teacher can do to help his students improve their reading of mathematics, I have chosen to concentrate in this paper on a description of the content of a reading lesson I give in my classes. I will begin by discussing some of the things that can be done to prepare for such a lesson, for many of these preparatory activities are in their own right important ways to help students read mathematics.

Readiness

The initial thing to be done in preparing for the reading lesson is to collect and study pertinent reading test results. This effort accomplishes three things. First, it defines the limits of the reading problems the math teacher must deal with. For example, a recent sophomore class at my school had a reading range from sixth grade to college freshman. Such ranges are encountered not only in reading ability but in mathematical aptitude and achievement as well. A study of these test scores will bear both on the selection of the texts to be used and upon the problems that the student will face after texts have been chosen.

Second, the test scores show the different forms that reading problems take. For example, a student's reading speed is of little importance in dealing with mathematical material; so, if a student has a high reading speed and appears only average or below in comprehension, then he may need help in adjusting his speed downward when reading mathematics. On the other hand, a student with more consistent test scores should perhaps concentrate on improving comprehension as far as mathematics is concerned.

Third, in addition to comprehension and speed scores, vocabulary scores on tests can be used to indicate students whose deficiency in general vocabulary may signal difficulties some students could have in mastering the new terms encountered in mathematics courses. In summary, I prepare for a lesson in reading in mathematics by learning about the general reading level of the class and the specific problems which individual class members may have.

The Lesson

For maximum effect, a lesson on reading in mathematics should be conducted as early as feasible in the school year. The assignment should involve no written work and should be devoted to reading an appropriate section in the texts. In making this assignment, I spend 15 to 20 minutes discussing reading procedures which will improve chances of completing the assignment successfully. Most students are interested in finding ways of improving their work, so it is usually profitable to begin by discussing with them the need to improve their skill in reading as it applies to mathematics. A lesson in reading mathematics, as with any other mathematical topic, should suggest ways the class may approach the assignment, along with explanations indicating why such methods will work.

The first step in our class discussion focuses on the issue of reading speed. I point out that different kinds of reading material require different reading speeds and styles. One of the major reading problems the average mathematics student appears to face is his tendency to read mathematical material as he would anything else. Students should not be misled by what appears to be a short assignment in mathematics because it contains only three or four pages of reading. Four pages of math may be equivalent to twenty pages in a social studies text or fifty pages in a novel. Although they can "read" the words of such an assignment in just a few minutes, this fact does not do the job; for students will not have a thorough enough understanding of what they have read.

Students need to know that mathematical writing is different from writing in other subjects. Mathematical reading is more densely packed; there are more ideas per line and per page than in other writing. In mathematics every word is critical because understanding the precise meaning of a single word may influence the meaning of an entire passage to such an extent that the entire reading assignment may be adversely affected. Also, mathematics is written at a different level of abstraction from writing found in other areas in a novel, for instance. In a novel much of the writing is about concrete things and everyday situations that one is familiar with, but mathematics is written at a high level of abstraction, being mainly concerned with ideas and symbols rather than things.

After calling class attention to the importance of adjusting reading speed and style, I then discuss with them the way they should go about reading the specific assignment. The details will vary, depending on the mathematics content; but there are some general principles.

First, I suggest that students read through the assignment once at a moderate speed without stopping in order to get a general idea and feeling of what it is about. I stress the importance of reading an assignment more than once and for setting a different purpose for each reading. The students should not feel that they need to have every detail clear the first time through because the function of a particular passage of mathematics may not be apparent out of a larger context.

Next, I urge them to reread the assignment at a very slow speed and to do this second reading with pencil and paper at hand. The student should be prepared to interrupt this reading both to think over and reread passages that are not absolutely clear and to take an active part in the learning process by using pencil and paper in a number of ways which will supplement passive learning involved in just reading. The following are examples of the kinds of pencil and paper activities which should take place when reading mathematics. Whenever possible, it is valuable to illustrate these in terms of the assignment at hand.

1. When the solution of a problem is being worked out in the text and there are steps omitted, the reader should be sure he can supply these missing steps. The best way is to write them down.

2. When a new technique is illustrated in the text through the use of an example, the student may wish to write down the reason

for each step. This practice will help to fix the method in his mind and will also serve as a model when the student works out similar problems on his own.

3. When the definition of a new term is given and it is illustrated with a figure, the student will be helped by drawing additional figures of his own. If the text supplies no figure, this activity becomes particularly important. The student's figures should include an example of the thing being defined and an example of something which does not fit the definition.

4. Students should note any questions they have about the reading. If something is still not clear after reading it a second time, students should put down on paper what it is that is bothering them. If the question is answered later, they should write the answer down also. If not, then they have a record of just where the trouble is, a record which can be referred to in class discussion or in an individual conference with the teacher.

This habit of asking questions of the author is a very important one to develop. In order to develop critical and analytic thinking, students must learn to answer such questions as "Why do I believe that's true?" and "Why does that make sense to me?" and "How could I explain that to someone else?" The student who has learned to ask such questions when reading his mathematics text and then proceeds to find the answers has taken an important step toward becoming a critical thinker.

Vocabulary Development

I close my first reading lesson with a discussion of the need for making real efforts in the area of vocabulary building. I share with the class my concern that some students are overwhelmed by the amount of new vocabulary they must acquire. They are urged to start and maintain a glossary of new mathematical terms they encounter. It is suggested that students take a few minutes each day and enter in their glossaries each new term with its definition. The glossary should be organized by units. It seems to have immediate payoff because in addition to hearing the word in class and reading it in their text, students have the further reinforcement that comes with having written it. The glossary is also of value as a ready device for reviewing for exams and as a convenient source for checking on words whose meaning may be forgotten over a time through lack of use.

The importance of vocabulary can be stressed by illustrating the need to know the precise, mathematical meaning of terms. An illustration I like to use is the word "between." This is a common word every student is familiar with; but this very fact may cause difficulty. It is used quite loosely in everyday usage; and though a student may have a vague understanding of a mathematical passage which uses the word, he may not know what precisely is going on unless he knows the specific definition in mathematics. Students must be made to see that ambiguous meanings which are tolerable in ordinary life may cause difficulties in the study of mathematics. An important component of mathematics education is the acquisition of the technical vocabulary of the subject.

Follow Up

I have found it useful to have written material on how to read mathematics to pass out to my classes. This material makes it possible for students to have access to the ideas discussed in the reading lesson at a later date. Also, such material can include ideas which may be useful to a particular student without spending class time on them. With the guidance of our reading consultant, members of our math department developed such material for use in our geometry classes.

If a reading lesson in mathematics is to be really effective, there must be follow up. I often give a short quiz covering the reading for two reasons. First, it gives me an idea of just how effective the reading lesson has been. (I would add that the results have convinced me that a one shot effort in this area is not enough.) Secondly, I think it emphasizes in the students' minds the fact that their mathematics teacher feels that this area is something they need to work on. This impression is particularly true for the fast reader who may be overconfident about his reading ability and also for the student who does not really believe that he needs to reread a mathematics assignment. Quite often the shallowness of their reading will be revealed to them when they see, by taking the quiz, that they did not get from the reading all that they should have.

It is my firm belief that mathematics teachers should break their habit of giving attention to explaining what is expected from a written assignment and then as an afterthought adding, "By the way, read the two or three pages in your text preceding these problems." I believe that efforts should be continued to involve teachers and reading specialists in finding ways in which content area teachers can help their students with the problems they have in reading.

Physical Education and Reading: Questions and Answers

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THIS PAPER has been reproduced to reflect, inasmuch as possible, the actual interview between Mr. Sanford Patlak, coach and physical education instructor at the University of Chicago Laboratory High School, and H. Alan Robinson, panel moderator. As stated in the introduction to this publication, the papers in Part One were originally given at a preconvention institute at the IRA convention in Kansas City, April 30, 1969. Presentations were delivered in formal paper or interview form. Although other interviews were converted into normal exposition, this one seems to capture the flavor of the presentation best by leaving it in its original form.

Interviewer: Sandy, how did you first become interested in helping retarded readers?

Coach: Well, as far back as I can remember, I was always an ace in sports, but I was far from an ace in reading. When I was in grade school, I was hit by a car, missed a semester, and was held back. When the teacher called on me in reading, I froze. I knew I had to get the words out, but I didn't know the words. If you've never had that feeling—boy, its rough! I know that some of the kids in my school today have that same feeling. They know the teacher's going to call on them, so they read ahead. They go down about three or four sentences. And there they are, reading ahead, not paying any attention to what the teacher's saying, trying just to figure out that sentence so that no one will laugh at them.

Three or four years ago I was sitting in the coffee room. The reading consultant's intern came up and we started to talk. She asked, "Do you think a coach could help his boys in reading?"I answered, "The kids like *their* coach. I could get them to climb walls —do anything. It would be easy." She suggested, "Why don't you try it?" The very next day I began "selling" books.

Interviewer: You have a sports collection, Sandy, a collection of books. Where is it? What's it like?

Coach: It's in a corner of the locker room. Nearby are bins of balls, skates, bats. The kids come in, and I have a traffic sign there that reads *Stop*. Another sign reads, *Here's the coach's bookshelf.* A poster—*Have You Read This?*—is there with some book jackets. This display really helps sell the books. The boys take a shower; they line up; the door is always open; they come in and check out the books. It is the best thing I've ever done in my life, probably. And the kids love it.

Interviewer: How did you start your book collection? Was the cost high?

Coach: Well, someone in our school was getting rid of a bookshelf, and I spotted it. And I said to the boys in my classes, "Listen, I have a bookshelf, and I need a couple of books." I said to my varsity basketball and soccer boys, "Has anybody got a few sports books that they're through reading?" The response was tremendous. The reading consultant put pockets in the backs with cards in them and marked the books *Property of Coach Patlak.* More books came in, and we checked these out. The mothers and fathers heard about it and brought some in. I bought books at rummage sales for pennies. I think that when we started, it costs us about ten dollars. Later, the reading consultant paid for some more books by selling some instructional materials to visitors. Then the principal heard about it and helped out.

The hardest part about starting was this. It's a lot of leg work hunting up the titles of good books. I think we've taken some of the leg work out of it for the next person. We've done this by giving you a book list, "Sandy's 99 Books for Reluctant Readers" (see Appendix A).

You can look it over and suggest some books for your coaches. Really, that was the hardest part for us. With the reading consultant's help, we've assembled some terrific books. They're right on the list—the coach doesn't have to look around for book titles or publishers. Those books really sell.

Interviewer: Do you see possibilities for this type of activity in innercity school situations?

Coach: Sports rate high in these neighborhoods. Suppose the coach is idolized by some boy in the depressed neighborhood. He might say, "Jim, come on into my office. I have this book. Can you look it over, read it, and see how you like it?" You like the kid. The kid thinks that now you talk to him! You may have given him a reading interest—a habit, maybe. You may have helped to keep him off the streets. It just might work.

Interviewer: Do you feel it's all worthwhile, and what are your results?

Coach: I regard this as a very important part of teaching physical education and coaching. If you select books carefully, books about techniques, you're going to have more playing power in your boys. Television is bringing sports events to millions, many ill-informed persons. Through books, boys broaden their backgrounds and add to their enjoyment as spectators.

What are the results? I know which kids are in trouble in reading because the consultant gives me the scores. When you see a boy, formerly a lagging reader, break a record getting dressed to get a book, read it, and ask you interested questions, I think it speaks for itself. I look at his report card and he's doing fine in his grades—fine. Of course, I didn't do it. But maybe I've changed an attitude and created an interest. And that's all I wanted to do—just create an interest. You won't go out and think that you can coach basketball. And I don't want you to think that I'm a reading teacher. But working together, we can do the job. And it's been proven that we can.

Interviewer: That's all I've got to ask for now. You want to do a demonstration? (Sandy dons his maroon phys ed jacket, takes out his whistle, and holds a demonstration reading session with the convention audience as his "class.")

Coach: I would like you to imagine that you're in my class. We can be anywhere. We can be by the swimming pool; we can be up in the gymnasium having gymnastics; we can be out on the field. What I do only takes about five minutes out of my class time. Out on the field my boys are running laps. Today I'm not going to give them exercises. Here's what happens. (Sandy blows whistle.) "All right, line up!" Now they're lined up. I've taken attendance. Then I ask the boys to sit in a semicircle on the grass around me. I've brought a carton of books out onto the field. Some of these I've chosen with certain boys in mind.

"Today, instead of exercising, we're going to talk about books." (Sandy pulls *How To Star in Track and Field* out of the carton, holds it up, paces back and forth, keeps up a running sales talk.)

"This one's topnotch. We'll be starting track soon. It shows you how to pace yourself, work up to distance running, and improve your starts. A tip you pick up may make you a better track man. Sports and books on how to improve your skills go hand-in-hand. You don't have to read all of it—just the parts that interest you—maybe only ten or fifteen minutes."

(Sandy displays a colorful paperback, *The Fighting Coach.*) "Here's one about a football coach in a small school who decides to take a job in a large college. Are there ever problems—a crooked trustee; a stubborn assistant; and, worst of all, so many pressures he almost loses his job—and something else. But wait! Read it and find out for yourself. A tremendous book!"

(Out of the carton comes *Strike,* a how-to-do-it book on bowling. Sandy waves it before his "class.")

"This is for a guy like you, Andy. Bowling is your own thing. You'll learn how to have the right stance, how to pick up the ball the right way from the rack. See how to bowl. Are there good pictures! One picture may give you a pointer."

(Here Sandy interjects an explanation.) I know where kids stand in reading. All the time it's going through my mind, "*You're* a very poor reader." "*You're* a good reader." I cover up my intent. If I hand out books during class, the first one goes to a top reader. But later I maneuver so that the right book goes to the one that can't read well. The book's reading difficulty has been color coded in the book by the consultant.

(Sandy now shows his "class" *Basketball Rules.*)

"You might want this one, Don. You're a good ball player, but there's a lot to learn about the rules. You can't play, you can't watch television intelligently, if you don't know all the rules."

(Sandy reaches into the carton and holds up "What Man Can Be," by Bob Richards. It's an article clipped from *Guideposts,* October 1968, and mounted on a bright construction paper cover.) When a kid gets hurt and is feeling pretty low because he can't play again, this one might be just right to talk about. "Here you learn about great stars who had setbacks. Take Bob Mathias. That boy's really got heart. His foot was badly torn. Later it became his take-off foot in jumping. You learn about determination and how great stars started up the ladder again. . . . After class, take your shower. Then line up for your books. All you have to do is pull out the card, sign your name, then put the card in the little file box. . . . One of these days I might say, 'Well, tell us about the book you read—just the highlights.' Now everybody back to the field!"

Interviewer: Sandy, why don't you say just a word about your "book reporting?"

Coach: It can happen anywhere—on the edge of the swimming pool, on the field. It may be in the gym, the boys around me on tumbling mats. I say, "I'd like to talk with you for a few minutes about the books you've been reading. Bill, you took one out the other day. Are you through with it? What was it about?" Bill says it was "cool," then gives a summary of an action packed story. When he gets up to a crest of interest, I say, "Hold it! Let them read it! Would Jim like it? Or who in the class would like it?" If it's a track book, Bill probably picks out the best track man. Then I ask, "Was it hard for you to read—hard words?" He answers, "No, sir."

Interviewer: Why don't you tell us about other experiences?

Coach: O.K. One day I brought a carton of new books to class and made my usual sales talks. I expected the boys to wait for the books until class was over. They closed in on me! It was as if I had gold bars from Fort Knox in that box. I have seniors in varsity basketball and soccer. They crowd around the bookshelves, too. Sometimes a school hero carries a book out under his arm, and the lowerclassmen see him. They say, "I want that book next time! Man, I've *got* to have that book!" After that, I just can't keep that book. It goes out with one boy after another.

Once in a while a book disappears for several weeks. Finally I remember who had it and ask about it. He answers, "Oh, my Dad's reading it."

I think a coach can do something else. He can "grab" kids with the sports page. Often before my class starts, I ask a question, "Did you read that article about so-and-so who was traded to so-and-so?" And that starts a chain reaction: "What did the Bears do last night?" "Where are they playing?" "How did the Cubs make out?" "Is their streak still alive?" These questions take the coach about a minute. It doesn't take much time to sell reading. I get my regular job done. My teams do all right. We had a winning season in soccer—third in the state.

Before I finish, I want to tell you what we have done so that the kids won't stop reading when they leave in June. I take five minutes near the end of school and say, "Soon you're going home for vacation, and I know you're all interested in reading some more books. How many of you have public library cards?" Those who have no cards are given applications. They fill these in at home and then bring them back to gym class. The last day of class in June I give out the cards to the boys personally. The reading consultant's intern does the leg work: secures the applications forms from the library, returns these to the library, and brings me the cards.

Interviewer: Thank you, Sandy. I hope we can convince physical education teachers and coaches throughout the world to follow your example.

Coach: I do too. It's great to play a role in developing lifetime readers—to know that you're helping students develop healthy bodies and broad, keen minds. I'm sold on being a part-time reading teacher.

The Art Room Book Collection

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WHEN I BEGAN TEACHING, I was living in a small town where all cultural material had to be imported. I felt the strong need for cultural experience. Books, magazines, slides, concerts, and exhibits were all scarce. I began to collect records of operas, symphonies, jazz. Clippings of art reproductions were saved and filed. I made frequent trips to nearby large cities to discover fine used books in such sources as book stores, rummage sales, Salvation Army, and Goodwill stores. My home library was born, and in my first years of teaching I kept my library in the school art room for the students to use.

I always collected books that were a challenge to my vision, my thinking, and my understanding. Fine books in many fields were gathered until I had about fifty books for my own use and for my students in art to explore.

The art library in the school where I first taught had a very limited budget for the arts, and the available volumes were pitifully inadequate. Many of the books were totally unrelated to the work being done in the classroom. I often lent my personal books for overnight or weekend use. From the very limited art budget, I was able to begin to build a classroom collection using the used book sources available. My first art room collection consisted of about 12 to 15 choice volumes at a total cost of perhaps $15 to $20.

Today at University High School I have been able to buy about fifty dollars' worth of books each year to add to the ever-growing collection of art books. Books from our high school library are taken on extended loan and kept in the classroom. My personal library, numbering now about 350 volumes, is still used to supplement the classroom collection.

When students need resource material for stimulating ideas, for just browsing; for locating material related to assignments; or for studying techniques, methods, and philosophy, the books need to be at immediate command. The availability of books at the moment of need is a special advantage. There is no cooling of first enthusiasm or shifting of interest while the student tries to secure the needed book from the school library. As students find solutions to many of their problems in books, their teacher's time and energies can be directed elsewhere.

Purposeful Reading

I use both the question approach and the related activity approach in leading the student towards reading. Here are some typical and current examples.

Sheldon B., a junior interested in science, planned a long term project in photomicrography. He knew nothing about the subject. I recommended a specific section in *Focal Encyclopedia of Photography* and told him to ask questions about any part of the text he didn't understand. Slowly digesting each paragraph and asking frequent questions about material he didn't understand, he read for four consecutive class sessions. At the end of the fourth day Sheldon was able to borrow a microscope from the science lab and a 35 mm. reflex camera from me; he then began his experimentation in photographing through a microscope. Sheldon's scores in reading on the national scale were in the upper quartile but on the local level were below the 50th percentile.

Carl, a black student, who had a reading problem, expressed interest in his own heritage in art. So, I directed him to books on tribes and forms of African art. He spent a good deal of time studying the illustrations and reading about his own people. We discussed the characteristics of the various tribal examples, and together we formulated some creative problems which challenged him and enabled him to depart from, yet use, the material he had studied. His interest led me to give to the art history class an assignment in which each student could investigate his own nationalistic and/or religious roots through art forms. The assignment proved most interesting, for written reports based on visits with artists, books and magazines read, and galleries visited, included the arts of Norway, Finland, Haiti and Jamaica, Czechoslovakia, and Northern Africa as well as art of the Jews and Russian Orthodox religious art. Reading was easily handled. Reference books were used from the room library, my personal library, the high school library, Chicago Public Library, and the University's Harper Library. The approach used here was to take the natural, expressed, personal drives to learn and channel these towards related reading materials.

Lonette came to me with the question, "What are Newtonian rings?" I said, "Why do you ask?" Her explanation was that her brother had trouble with such rings in making photographic enlargements at home. I got the *Focal Encyclopedia of Photography*, and together we read the brief description of Newtonian rings. We discussed the phenomena. As I left her to help someone else, she was still reading. She indicated that she understood. The approach for her was one of seeking information related to a particular unsolved problem.

Purposes and goals may already be stated, as in the examples previously given where Sheldon, Carl, and Lonette all had strong reasons to seek out information. Oftentimes, meaningful assignments will trigger the drive to read. The nature of the classroom art activity may also accomplish the same purpose. Generally the steps toward reading may follow this outline:

1. The student indicates the nature and direction of his art activity.
2. Teacher and student confer about the project and codetermine the depth of interest and involvement.
3. Procedures, materials needed, skills to be learned, content to be acquired—all these are discussed in order that the student may begin his project.
4. Reading suggestions are given to the student as the teacher keeps in mind the reading level of the student. Suggestions are made as to where the student may go to find additional relevant reading materials. Often the student ignores the suggestions given and ferrets out his own information, sometimes from the family library.

When a student indicates that he doesn't understand, several alternative choices are open to me:

1. I can sit down with the student and read the material with him, explaining the terms he does not understand and clarifying the material verbally to him.
2. I can direct him to simpler material.
3. I can have him read a paragraph at a time. I can discuss the material with him paragraph by paragraph.

If the material is too simple, I help the student find that which challenges him. Sometimes other students are a great help in explaining meaning in readings. I often ask the students with the greater experience and background to help those of lesser competence with either the project itself or with reading material. Frequently, my personal library will provide just the right book for a particular student.

Work with the Consultant

Just a few years ago Ellen Thomas, our reading consultant, discovered the art room library and we two began to discuss the implication of such a collection. I began to realize through her perceptive insights that more than just availability was possible. We speculated that nonreaders or poor readers might be encouraged to painlessly begin reading with enthusiasm and interest.

Retarded readers, including prospective dropouts facing failure in reading subjects, gravitate to art class searching for success in a nonacademic field. The art teacher takes full advantage of this special opportunity to capitalize on artistic interests and make readers of students no one else can reach. With a few words of advice, he guides discouraged readers to books where successful reading experiences are possible. Through handing the right book to an academic misfit, this teacher helps to make school a center for success instead of failure.

Miss Thomas and I are constantly in touch with each other. We spend hours in talking about libraries and reading motivation. She armed me with data cards indicating IQ, reading scores, reading level, and other pertinent data. My present practices are to read the scores, keep in mind the level of the student, and then match them.

At times though, I work intuitively by finding the most relevant material and suggesting which small portions of that material should be investigated or learned.

Miss Thomas also offered her services and those of her assistant in coding all the books in the art collection according to their reading difficulty levels. I could then match the individual and his art interests to appropriate reading material—appropriate in content, vocabulary, and structure.

Results

The art room book collection is one of the busiest spots in our building. Not only art students use the books, but visitors, parents, other teachers, and students from other classes also come to consult and to borrow. There is special gratification when, as the year advances, poor readers "graduate" to increasingly difficult reading.

Regarding a fascinating book as a "silent reading teacher," I observed these benefits for retarded readers:

1. Successful experiences with books related to students' compelling interests help to remove psychological blocks to reading.
2. Poor readers are not print oriented, the world of words is not normally their world. But when a teacher guides them to a book on the right level of difficulty and interest, they may spend hours in a world of words. Here they are able to meet and gradually learn new vocabulary and to practice comprehension.
3. Use of the class collection daily builds toward habitual reading. Students are constantly exposed to powerful reading stimuli.
4. An absorbing interest in some aspect of art may help poor readers stretch their reading power and handle reading materials otherwise beyond them.
5. By consulting the collection for techniques and procedures, students are developing the capacity for independent learning—learning how to learn through reading.

6. A student's self-concept determines much of his behavior, including his reading behavior. A young person who views himself as an individual who cannot read tends to fulfill his own expectations. His concept of himself may be altered by experiences of success and approval. A modification produced in art class may result in increased productivity and improved achievement for the student in the broader school situation.

Now that I teach in a large city where bookshops, libraries, and other reading centers are readily available, I still supplement the collection from rummage sales, Salvation Army stores, Goodwill centers, and sidewalk book sales. My own home library is used as I bring special books related to the course content or to individual research projects into the classroom.

Often I read passages aloud to the class or to individual students to get their thinking started. Recently the art history class was deeply involved in discussing the question "What is art?" At an appropriate moment I read a quote from Andreas Feininger's *The Creative Photographer*. After class I was asked if the book could be borrowed for overnight use. Arrangements were made to do so.

Often students begin their own private library collections as a result of reading successes in the classroom. Judy, a sophomore, in response to an assignment to find the work of some artist whose work most closely resembled her own, wrote of her reactions to Picasso's work and brought in a new book on Picasso for me to see and to use as I marked her report. She commented, "The best thing about the assignment was that I added another fine book to my personal collection!" My student teachers bring in books from their home libraries and from the university library and leave them on my desk as reference material for certain students or for anyone demonstrating an interest.

It is my belief that specialized book collections should be available in all classrooms to be used as interests in personal investigation arise. New and used books are often donated to the art room library by interested visitors, parents, and other teachers in the school. The science department has given several obsolete volumes to the art department. The discontinued volumes from the university's art library often find a home in the art classroom. When the high school library discontinues certain volumes, we add them to the bookshelf. Textbook changes from various departments enable us to add resource books in math, science, or drafting.

Concluding Remarks

There are some problems. For example, there is always the problem of thefts. My classroom library was formerly in an adjacent room where students could quietly go and do research, browse, read, or just relax with a book. Many fine volumes were stolen, particularly those dealing with nudes, anatomy, photo techniques, and with Dada and surrealist art. Such volumes are now kept out of reach in locked cabinets. These may be signed out for period use only or for an occasional overnight loan to art teachers. I have moved the art library into the art classroom where I can constantly check the volumes. I used to keep 200 or more volumes on the shelves. Now about 75 carefully selected books are stocked. The shelves change from week-to-week as new needs arise and old needs are satisfied. We return some books to the high school library and add others. Thefts are less frequent, but they still occur. I hate to think of keeping the books locked up. I would rather keep the books available and lose a few. The books I bring from my own home are used only by the period. I do not loan them for overnight use.

A spiral notebook is used for check-out procedures. The procedures are as follows: List your name, homeroom, title of book and author on the check-out list with date borrowed and date for return arranged with the teacher. If the book is not returned on the required date, I summon the student and retrieve the article.

Another problem is that some students are not reached at all. They are not anxious to read but only to do. They avoid reading suggestions and reading assignments. They take a grade of *F* on the books rather than meet requirements. But I feel that the teacher can encourage and help students turn toward reading. The content area teacher is limited in what he can do for retarded readers. He is not a reading specialist. He can merely open some doors.

Let me share one happy experience with you. Charles, a somewhat retarded and reluctant reader, had great successes in art work but not elsewhere. I encouraged him to look at work by other artists in the art room library. Charles started to look at slides and the art work reproductions in the books. He didn't read at first. Later he became curious about the ideas expressed by artists as I read occasionally to his art class. He began to read small bits of information related to the artists whose work he admired. He joined an art book club and began to build up his own home art library. As each new book came, he would bring the precious volume to me so that I might share in his newly found joys. I felt some success with Charles.

Social Studies and Reading

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WITHIN THE PAST FEW YEARS there have been such changes in our world and in our people that social studies teachers, in particular, have become unsure and questioning. Nevertheless, let me tell you about social studies and reading in our school—what we do and what we need to do.

Today

With our younger students we are using, on a trial basis, materials in economics developed by the Industrial Relations Center, University of Chicago (*1*). These materials are made to build economic understanding; particularly understanding of relationships between resources, production, consumption, and trade (or exchange). Two books are provided, with a packet of maps and charts. A simulation game based on trade has been made. Each teacher is provided with books outlining teaching strategies and suggesting resources. Each student has two books and a set of maps for his own use. In book one he reads of a shipwrecked man, Adam Smith, who drifts to a small island south and east of Hawaii. Adam's life here is set up as a model in economic behavior—the island being described in detail through words, pictures, and maps of land formations and vegetation. Adam's days are described and on the maps his explorations are charted (the text describes his trips). Students work on problems such as the best location for Adam's house and the distribution of his time as he makes shelter, a bed, and utensils from natural resources. Later, a group of eleven persons is marooned on Adam's island. They build a community. The model takes on real identity. Some students understand this island as they will never understand their local area.

I speak of this project material in such detail because it can represent the materials from dozens of other social studies projects. Within the past few years, plans and teaching tools in history, geography, anthropology, and economics have multiplied. Generally these tools are planned with the help of social scientists; the materials are produced by teachers and persons wise in the psychology of learning; reading specialists are consulted; and the result of this cooperative effort is a set of readings, pictures, films or filmstrips, maps, exercises, and a guide for the teacher in the use of the materials. Many of these projects were heavily funded by the United States government or special foundations. Much of the production is attractive, challenging, and useful. Before it is widely circulated throughout the country, it is tried out in selected classrooms. This part is where my classes come in.

From the standpoint of reading, I am meeting several problems. One is that the material is very closely structured and paced for an average reader. At certain points the teacher's help and explanation are essential for going ahead successfully. The planners fear that supplementary materials and experiences will break the sequential development of the concept. To illustrate, study of the geography of the Pacific or of the natural resources of Illinois can be distracting from the main purpose of the project. So what does a teacher do with a group in which some students complete the work of Adam's Island in two weeks, while others require help (often this is vocabulary help or the reading of closely knit directions) to make the same progress in six weeks? Many such projects make tangential take offs very difficult.

I quote from the foreword to the books which says that this is "... an integrated program of materials designed for use under carefully prescribed conditions." And to break up the sequence of the material is to often lose the whole point.

I urge teachers of reading to become acquainted with social studies project material. Think of the classroom teacher's problem with uneven rates of progress. Too, consider the possibility that the many approaches to one concept—to production, say, in my example—may never take shape.

Now to take up, at eighth grade level, another aspect of the social studies-reading relationship. In a year centering on the United

States before the Civil War, we have used many paperbacks, providing a good United States history text to knit the whole together. At this level let us think about what teacher aids paperbacks need in order to serve usefully. First off, they need the scrutiny of someone sensitive to reading difficulty or level. Our reading consultant has given such help often. Then most paperbacks need special kinds of aids—usually written—before the book is studied. Let me illustrate: *April Morning* by Howard Fast is better used if the student is provided with a chronological list of anti-British demonstrations preceding the confrontation at Lexington. *Uncle Tom's Cabin* seems to me to need an outline of the two or three major plot lines of the book. *No Other White Man* by Davis is helped by a well-made map of the Lewis and Clarke Expedition. It enriches paperbacks if the teacher or reading consultant or librarian can provide the right lift-off. Generally these explanations should be brief and pointed. There is no need to introduce a book to death.

In the ninth grade we find another, more subtle, reading situation. The area is prehistory; the teachers have produced materials to stimulate the study of an ancient site at Torralba, Spain. The location is one now being studied by archeologists from the University of Chicago. The materials try to bring the dig and the methods of the archeologist to the classroom. Bones have been reproduced; drawings of the distribution of stone, wood, and charcoal materials are provided. The students are asked to solve the mystery of Torralba. Who lived there? When? How? Many reading problems in this study are not linear. They can be illustrated by this: three maps of the site are provided with one showing bone remains, one showing tools, and another showing a variety of items. The students are told that the workers now at Torralba believe that special areas of this site served special functions. After careful study of the maps, students are asked to identify and circle the areas which have identity. (One area, for example, appears to have been a butchery.) This is reading—the careful study of these maps. And it indicates the demands made on students, not only in our school but everywhere that teachers are innovative.

In the tenth grade the emphasis is on the Greeks and the medieval times. Two reading situations come to mind. In connection with the study of Greek philosophy, sophomores are asked to read Plato's *Allegory of the Cave*. This excerpt from *The Republic* is relatively readable and quite easy to comprehend. The question is, how do the symbols of chained men, shadows, and the sun give Plato's view of government, or education, or the structure of society? The reading help that has been basic is to ask students to draw the cave as Plato describes it and then, when it is visualized by students, to identify each symbol: the echo, the chains, the voices, the men. Only when the cave and symbols are clear, can the reader interpret the message of the allegory. At another point in the sophomore year, students are given three readings: a description of the daily life of a French peasant Bodo, an expense account of an English manor, and a description of life in rural England about 400 years later than the date of the expense account. The readings are dittoed; the students receive a rather open-ended assignment, and they learn only as they ask themselves: What am I doing in this class? What is this material in my hands? What is the relationship of what I have here to what I am doing? Careful study of these three records of medieval times, covering a period of 450 years, opens up the ways in which life changed between 900 A.D. and 1350. It is a highly sophisticated reading situation.

Concerning electives, usually open to juniors and seniors in our school, we have most years set up as reading standards for admission to the classes, not only for a high reading level but also for mature reading behavior: self-direction and research skills. But each year one elective is provided for students who are not advanced readers. Currently this elective is called *Urban Studies,* and it uses many audiovisual aids and field trips in addition to readings.

The required course in *American Studies,* for juniors and seniors, has an interesting reading aspect. Much use is made of documents—real documents with all their problems of outmoded style, legal phraseology, and often awkward form. One used in class is the orders of the day to a British army officer stationed in Virginia in the 1600's. Our reading consultant has helped in making this document mean something to our students.

Later these older students are generally given the Henry Holt readings and problems on the Chicago Strike of 1894 or the Pullman Strike (*2*). The Holt booklet presents interviews, profit statements, minutes of arbitration sessions, and executive orders. Custom-made helps are not necessary here, for the publisher has provided these. The problem is again: What am I doing? What am I reading? How are they related? In these readings the color of bias is clearly seen. Truth and justice are elusive. Students who use the Holt collection related to the Pullman Strike need every reading skill that has been identified.

Tomorrow

I should like to repeat that this is only a partial and rearview mirror description of our social studies. Briefly, let me identify some aspects of the future that we see and for which we are really not prepared.

The first is the growing power of electric media—radio, films, computers, television—to provide information and shape attitudes. Marshall McLuhan believes that the schools are outdated, and in his own words says, "It's a dying and outdated system founded on literate values and fragmented and classified data totally unsuited to the needs of the first television generation" (*3*). We teachers do not feel so grey about the reading future as McLuhan, but we do know that we no longer control the curriculum. And we recognize the new type of student which McLuhan calls the TV generation.

Another concern is black militancy as it affects the social studies program. The greatly increased production of materials in Afro-American studies and the acceptance of these studies in the schools pose a special reading problem. Our position at the laboratory schools is that well-trained and sensitive black teachers on our staff are the start. It may be some years before Afro-American studies will find their appropriate and scholarly place in the social studies. In the meantime, as firmly as we can, we hope to move such studies into the broader areas of world and U.S. history and to consider Afro-American materials from the viewpoints of anthropology and sociology.

A third push toward change is the involvement of our students, at an early age, in politics and community life. Only recently, in any real sense, have I seen high school students bearing the weight of decision-making. When the national voting age is set at eighteen years, as it will be soon, our older students will be different. Even though far from legal voting age, the high school student in many places is a highly political being.

The fourth problem we face is a lack of faith in authority. I am not thinking now of authority in terms of a teacher, a policeman, or a parent. Rather, I mean that young people have developed a wide credibility gap. Accepting the law, accepting statistics, accepting reports of serious groups—these are harder to do now than ever before. "My viewpoint is based on these authorities" is not heard often in our school. Of course, for years we have been working to help students in critical thinking and in detecting bias. But I hope we can help them to see that there still is truth or approximate truth. And there is the false, though never completely so. Lewis Paul Todd of *Social Education,* the journal of the social studies teachers, tells of an old professor of his who drew a horizontal chalk line on the blackboard and then, starting at the left and moving across the line, wrote above it the words *true, probably true, possibly true, possibly false, probably false, false.* Students who think in terms of black or white—or mostly black—can gain from exposure to a line like this.

I have told you something of what we are doing at the Laboratory Schools and have confessed to some of our unsolved problems. Let me end on a solid note. I think every social studies teacher at our school is a dictionary addict who tries to spread this addiction to every student. All of us know that the materials of our area must be selected and studied and changed. There is no "book" that can do our job. And all of us, to this date, at least, believe that reading is the most fruitful activity our students have.

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Reading Techniques in the Teaching of Music

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IN MOST MUSIC CLASSES at the secondary school level, reading is not a critical issue. In the performing groups, sightreading is seldom a skill which is intentionally developed; and, thanks to frequent rehearsals, performances are to a large degree polished through rote practice in rehearsals. There are, however, two areas in music education which demand an extraordinarily high level of reading competence, and it is often these very courses which determine the success or failure of the student in music school. Since the student's performance in these two areas is so much more dependent on his reading abilities than on his musical skill or native intelligence, although certainly the latter is related to reading ability, it would seem that a critical evaluation of reading difficulties in music and their causes should merit some immediate attention. Unfortunately, little, if any, attention has been given to this problem to date; and it is interesting to observe one possible cause.

Musicians in academia, unlike most other members, are divided into three warring camps—scholars, performers, and educators. In the lists, their shields are blazoned with different heraldic emblems: princes bear PH.D., D.M.A., and D.M.E.; lesser nobility carry M.A., M.M., and M.M.E.; and the pawns bear B.A., B.M., and B.M.E. The erudite scholars, who do, in fact, know the correct factual information, encode their messages into articulate, polysyllabic verbage and have them bound into scholarly journals. The performers, men and women who breathe the very fire of the living art, seldom bother to communicate verbally. They hide their guild secrets in both silence and musical sound. Their admirers must either apprentice in the guild, lose out, or teach themselves. The latter method has proven to be somewhat inefficient. The educators are a peculiar lot; they are neither fish nor fowl. Although they perform, they often do not possess the polished finesse of the specialist. Although they deal in historical and theoretical problems, they usually lack the depth of knowledge in this area that is the mark of the learned musicologist. Still, they are the only group vitally concerned with the education of the young, an education which revolves around performance and musical tradition, and the only group knowledgeable in pedagogical theory; by virtue of this fact, they are the only ones capable of producing a first-rate text. But, sad to say, their books are as full of misinformation and error as their scholarly colleagues' books are full of unintelligible truth.

This seems to be the situation when viewing the field in groups. In theory, a dedicated, intelligent, talented, and educated individual could bridge this chasm. Certainly a committee of such people would be better still. After all, it has been done of late in the mathematical and physical sciences. Unfortunately, it has never, in this century and in English, been done in music history or music theory. No music history text has accurate, meaty, up-to-date information in a form that is comprehensible by the average college undergraduate. The distance of these texts from the ability of the average high school student who might be interested in learning about this fascinating subject is only magnified. The situation in music theory is worse. To support these rather damning statements, I offer the following evidence:

The Flesch Readability Formula (*3*) was applied by the University of Chicago Laboratory Schools' reading consultant or her assistant to all the major music history texts appearing in the 1966 edition of *Textbooks in Print* (*1*). The survey resulted in such disheartening conclusions as, "Our best students may be able to cope with this." The Laboratory Schools' best students are very fine readers. Has no one concerned himself with the average undergraduate in the average music school or the average high school student in the average secondary school? The three best known and most used texts (*2, 4, 6*) were all ranked "very difficult," a level higher than college level which has the annotation, "the difficulty of very difficult technical material . . . may require professional training to read." The standard special area books, such as Reese's *Music in the Renaissance* (*5*), are even more opaque, even though the content is superbly rich and beautiful.

Music theory texts are almost in a class unto themselves. Very similar to an algebra text or a geometry problem book where each letter, number, and sign must be carefully considered, tasted, chewed, swallowed, and rechewed like a cow's cud, it becomes obvious that one does not really read a theory book; one grapples with it in a life and death struggle.

As has been implied, there are some books which are easy to read. Unfortunately, the content of these is unenlightened. The writers of these history texts know little or nothing of early music, and the authors of the less-than-dense theory texts are superficial in their treatment. Perhaps in all reading situations, the teacher is well advised to make special efforts to introduce students to the particular reading techniques of the discipline in question; but in music, it would be sadistic not to do so. The student can hardly be expected to digest a book that is inedible for the teacher.

Of course, this paper is articulating a plea for knowledgeable authors and publishers to correct this situation with all deliberate speed; but until better texts are available, this author is taking the opportunity to suggest a few techniques that have been developed in an attempt to compensate for the malnutrition of the texts themselves.

First, try to anticipate your students' reading problems by as many means as are available. If test scores for standardized reading tests are available for your students, interpret the data so that you might compare their probable reading performance and ability not only with national norms but with the local population as well. If academic difficulties develop during the year, this kind of information will prove useful in attempting to interpret the symptoms and prescribe remedies. This data also has preventative uses.

Another relevant piece of information that this author wanted and that standardized test scores could not provide was some measure of the student's actual performance with the specific text in use. Acquiring this information can be simply accomplished by constructing an in-class reading test. Select a subject which is unfamiliar to your students but which is covered in their text. Allow them the use of their text but offer them no guidance during a timed quiz on this subject matter. At the end of the test, ask them to rate the reading difficulty of the passages they just read, the relative liveliness or dullness of the style, and the clarity of the explanation provided by the book. The results of the quiz must be interpreted in the light of other known information about the student (for example, IQ, writing ability, and general sophistication) but the results will assuredly indicate such important items as shortcomings of the book, need for supplementary reading material, and necessity for teacher preview and preparation. It is difficult to ascertain the inadequacies of an index or glossary until one is confronted with the necessity to use these tools in a real reading situation. The graph that is so easily understood with teacher explanation is often consistently misinterpreted by the unaided student. Reading score cards and teacher-made text-tests can at least aid the teacher in identifying the foe. Direction is crucial when fighting the good fight.

In response to the needs of laboratory school students in music history and music theory, it became obvious that early in the year time must be taken to demonstrate how to study and prepare an assignment. Instead of dictating the assignment traditionally and sending the student home or to the library with no further instruction, it became clearly preferable to make the assignment and then dedicate the next few class periods to the actual preparation by showing how the teacher would attack the problem—previewing the lesson, questioning, reading, cross-referencing, and so on—and then supervising the students in the same processes. This approach is preferable to leaving the preparation to chance. The teaching of method and technique is infinitely more important at this stage than attempting to move directly to content. Where method is faulty, the acquisition of knowledge in any form is likely to be faulty.

To supplement these initial in-class study sessions, a short, five-page summary of reading techniques applicable to music study was prepared by Ellen Thomas, the reading consultant of the Laboratory Schools. In capsule form, it summarizes the ideas covered in the teacher-student, in-class study sessions. It came as no surprise that the summary of music theory reading techniques paralleled the techniques of mathematical and scientific reading most closely.

In summary, the author would point out that adequate texts in music history and music theory are not now available if we consider readability as a criterion of adequacy. The burden of compensating for this deficiency falls on the teacher and, if he is fortunate enough to have one, the reading consultant. Pretesting can help in analyzing symptoms, predicting and caring for academic problems, and anticipating necessary teaching techniques. Attention to reading techniques as a separate discipline can help to prevent, or at least to minimize, future problems. For an area so universally acknowledged to be pleasurable, as music indeed is, it is incredible that texts presenting the heart of the subject can be, in themselves, so painful.

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The Writing-Reading Approach in English

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THE STUDENT is tense. It is his first day in high school. He is clutching a computer-made slip that says "English I, Kaplan, Room 304." He starts to walk in, responds with bewilderment, backs up, rereads his slip, examines the room number next to the door, and goes in, thinking or saying, "Is this my *English* class?" (The room has the appearance of a student lounge.)

On the chalkboard he sees my written response to his question and reads it: "This is English I, Kaplan, Room 304." Then he selects an easy chair or an armchair (the couches in the circle are already occupied) and sits down. He has now "read" what could be called the introductory paragraph of a nonverbal discourse. He knows the silent language signals of furniture and has interpreted accurately the setting, tone, mood, atmosphere, and attitude of "English I." He can relax.

We spend our first session together with informal, get-acquainted talk. We communicate facts and feelings about neighborhoods, sibling problems, hobbies and interests, pets, pet peeves, and schools. Everyone finds at least one other person to share a feeling with, in sympathy, empathy, or laughter.

I try to say just enough in this first period to let each student "hear" my voice in his memory when he reads the personal letter I give him just before the circle breaks (see Appendix B). I can't take time here to share with you the variety of responses I received the next day. I'll just quote the briefest of all—three large block-printed words: THIS IS RIDICULOUS!

This introduction *would* be ridiculous, both for my school year and for my paper, if it did not have a compelling purpose. With my students, I am creating an atmosphere and establishing relationships in which meaningful personal experiences will be shared willingly. With you, I am providing an example of how I start to develop attitudinal readiness for a lengthy writing-reading *experience* and giving you a mental picture of the setting in which it occurs. The traditional English setup and procedures have been reversed: the student feels and thinks before he talks or writes; then, while he feels and thinks, he listens or reads. There is *no* communication without a real purpose.

Rationale

In Appendix B you will find a few pages from a sixty-six page document called "Literary Man: Writer and Reader," written by three of our teachers.* "Literary Man" describes in detail, with examples, the steps we take with our students at three different grade levels to create enthusiastic involvement in both writing and reading. The pages in Appendix B are devoted to an exploration of the purpose and rationale for our nontraditional, role-playing experience—actors and audience, authors and readers, face to face, in meaningful dialogue.

We have found numerous advantages to our procedures of constantly weaving together writing and reading. First, such an approach really only requires a sensitive teacher who loves and respects the learner, plus learners who can read handwriting and write (manuscript or cursive). A good librarian and a fine consultant help, of course. Thus, such an approach is appropriate for every grade level.

Second, the approach involves every individual in the class, deeply and personally, whatever his background and ability level. Thus, it meets today's "crisis in education" need for curriculum content that is relevant, interesting, and meaningful for the learner.

Third, it puts into practice the best knowledge we have today about how individuals learn and the nature of teaching. Thus, students experience gratifying flashes of insight, learn from and help one another, and build sensitivity. School becomes exciting.

Fourth, it puts the teaching and learning of basic skills into a proper position in the curriculum by creating a demand for them when the learner needs grammar, spelling, and reading competence for his own chosen purposes. Thus, it disposes of the problem of motivation.

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* Sharon Feiman (sophomores), Darlene Friedman (freshmen), and James McCampbell (Pre-freshmen).

Fifth, it produces learning that is enduring. (Our students have shown better than average growth from year to year on the STEP Writing and the COOP Reading tests.) Thus, it develops literacy.

Sixth, it provides personal growth with numerous new insights for the teacher sensitive to children. Thus, it meets human needs and helps our profession.

Procedure

Back to my classroom.

I play the timing of this active experience by ear. It can't be successful until every student trusts me, and until most of the students like and trust someone else in the class. They all know, through experience, that I don't even own a red pencil, that I have never ridiculed a spoken or written communication from them, that I have never read a piece of writing out loud without the student author's permission, that I have never put a letter grade on a written message, and that I have responded (with written comments or a personal talk and with real interest) to every student's writings.

I begin by asking the group to respond to the question, "What is writing?" As each student brings me his paper, I give him a set of quotations about writing by familiar professional writers and ask him to compare his own writing experiences with one or more of the authors.

The next day, I ask everyone to jot down from memory an incident that occurred a long time ago. I make it very clear that he should write only what he is willing to share with the rest of us.

When I read aloud each incident I have selected (with permission from authors), we spend as much time as we need in discussion. We talk about what happened (what the words said), what the incident was about, what was implied, what the incident reminded us of, and how the writer felt about it. Inevitably, we get to comparisons of how something impresses us at one time and how we understand it later. When we have an incident that has really evoked interest, amusement, or strong responses from the group, we analyze it together on the chalkboard where I write headings for what we talked about: Level 1 (Literal), Level 2 (General Theme), Level 3 (Writer's Attitude or Thesis).

When most students have caught on to the idea of levels of meaning (this may take several analyses and several days), they get together in small friendship groups and work out similar analyses for each one's piece of writing. Frequently a student chooses to bring in a new written memory for his friends to read. When all the incidents are analyzed and the arguments between each author and his readers are over, each group has a representative read the group's most interesting writing and its analysis to the rest of us.

We then try presenting themes and incidents in a different way. The students form their own groups (at least four) to invent and act out skits that will communicate something to an audience. I say, "I am going to give each group a theme. Don't tell the other groups what your theme is. Make up a skit to illustrate that theme and the class will try to infer the theme from your skit. Your purpose is to get the audience to understand the idea or feeling you're trying to convey." I try to pick themes from incidents we have discussed. For example, I gave two groups the same theme, "Adults frequently misunderstand teenagers," and the two other groups the same situation, a boy-girl relationship, with opposite themes: "Girls can be very mean to boys" and "Girls can be very kind to boys."

After interpreting the skits, we went on to analysis of professional short stories and fables chosen by the class; each student spent a week or two in writing a poem, short story, or essay based on a theme or incident from his memory; we studied the art of literary criticism and compiled the criteria for "Professional Manuscript Readers" (in Appendix B); student groups invented publishers' names, read manuscripts, and wrote letters to the authors with reasons for accepting or rejecting their work; authors replied in writing and in person to their critics; successful writers put their works on stencils; and a committee of students designed and produced a "book."

Conclusions and Implications

You can draw your own conclusions about the impact and success of these activities from these student evaluations:

> All of a sudden, I saw how a writer, the artifact, and the reader all go together; and I had a chance to be all three. (He explained that he was part of the artifact when he was in the skit.)
>
> An author never writes from an idea that he picked out of the sky; he needs something to trigger this idea.

This very articulate student sums up what can happen when a teacher sets his students free:

> This unit has almost completely changed my view of English. I have learned that English is centered around a very important and very crucial concept called communication. English is built on the ability to transmit in, and respond to, any given medium of communication, be it verbal or nonverbal, written or spoken. I learned that there are many mediums of communication: plays, opera, music, movies, novels, short stories, paintings, poetry . . . .
>
> I learned that communication is a two-way street, made up of the person who produces the literary artifact and the person who views and responds to it. Both persons have certain obligations. The author must be able to convey—through the careful use of characters, plot, actions, scenes, and setting—a certain mood, feeling, thought, point of view, or theme to the reader. The responsibility of the reader, if the writer has done his part, is to ascertain the meaning of the writer's artifact.
>
> However, it must be realized that the writer's artifact is subject to a large amount of interpretation on the part of the reader who may well take a different point of view . . . than that of the writer and come up with conclusions which differ from or even oppose those of the writer. This is the risk which both the writer and the reader must accept since no two people are alike or take the same point of view on any given subject.
>
> Through writing short stories and reviewing the works of other students, I gained in may ability to find the theme, symbolism, and meaning in a short story, essay, novel, or piece of poetry. I

also see more readily the hidden ironies and paradoxes brought out in a literary artifact or other form of communication.

All in all, it can be said that the scope and depth of my experience in communication, both vicarious and direct, have been broadened and increased. My perception of people, ideas, and events has been increased, and this course has helped change my own views, attitudes, and concepts.

Teaching the Reading of Biology

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EVERY SCIENCE TEACHER has the problem of getting students to comprehend scientific principles and processes, many of which are abstruse. I was puzzled for some time by the inability of some students—especially those who apparently had otherwise good minds—to exhibit an understanding of science, either on examinations or in class discussion. I finally concluded that the major problem was the failure of the students to absorb what they had allegedly read, since the main tool students use in learning is reading.

Study Aids

I began to talk to classes about their books; how study aids have been built-in; how they can use these to aid comprehension. I developed a talk which I call, "How to Get the Most out of Your Ten-Dollar Textbook." I begin the talk or lecture with a discussion of the author's prefatory remarks—which students rarely read of their own volition—in which text organization, purpose, and the use of study aids are explained. I then have students turn to the preface of a text. The book, *Biological Science: Molecules to Man,** a product of the Biological Sciences Curriculum Study, is outstanding in this respect. For example, there is an entire page devoted to study aids, in which the scheme is outlined: important concepts, theories, and terms are printed in blue boldface type when they are introduced; terms that form part of the special vocabulary of biological science are printed in italic boldface type; scientific names of organisms are italicized; each section of a chapter is followed by a short summary and questions to help the student check his understanding; a summary follows the chapter itself and contains the big ideas to be gained from the chapter; a longer list of questions and problems follows the chapter summary; there are seven appendixes outlining procedures, chemical processes; and the pronunciations of some of the more difficult terms are given when the terms are introduced. After going over this outline page of study aids with the students, we return, point by point, to examples of each of the study aids in the text itself.

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* Biological Sciences Curriculum Study. *Biological Science: Molecules to Man.* Blue Version. Boston: Houghton Mifflin, 1968.

Students don't usually appreciate this attention to the organization of a text during the first week of school. The students' awareness of difficulties doesn't usually manifest itself until later—often after an exam. In order to help students become aware early, when it will be most advantageous, I assign a few sections of the text for reading at home and at the next session ask "How many of you had difficulty with the reading assignment?" Very few hands go up. Then on the material that "gave them no difficulty," I ask questions which most of them can't answer. It becomes obvious to students that their reading has been superficial—that their comprehension and/or retention was inadequate.

At this point I start to help them with specific pointers in the study of a science text. I rarely assign a chapter in its entirety for reading at one sitting. I prefer to assign for the next session one, two, or three sections which constitute a logical entity. I think retention is higher when assigned reading doses are small.

I use what are essentially the SQ3R or PQRST approaches and have found them most helpful. The reader first quickly looks over the material to be read to get the general idea; then he reads the material. I suggest that my students read only a few paragraphs at a time, attempt to grasp the ideas presented, and remember specific points, terms, or other data presented. Then, when the students are satisfied that they understand the paragraphs, they may proceed. After completion of the reading, they go through the material again, this time concentrating on individual words to be learned, data to be memorized, and the like. Finally, they are asked to check themselves for comprehension by using the questions at the end of each section.

Most of the students become committed to such study approaches by the evidence that they do work. Students find an increase in their ability to discuss the subject matter intelligently and perform satisfactorily on exams. Exam results help most students judge their ability and progress in a course. I regard such attention to study aids and techniques as a necessary and proper introduction to the course—attention which pays off in increased efficiency by the students.

Technical Vocabulary

Most modern science texts have some means (e.g., heavy, colored, or italicized type) of arresting the student's attention when a technical term is introduced. The teacher's job is to convince students that they cannot consider the assignment completed until they have mastered the spelling, pronunciation, and meaning of the terms. They must stop, look at the word, vocalize it, read the definition, and read and reread until they know it and are able to assign a definite meaning to it in their minds. They should attempt to analyze the word by disassembling it. Then they should learn to spell it correctly so they may reproduce it accurately when needed.

Since most scientific terms are of Greek or Latin origin, it is often helpful to introduce those prefixes and suffixes which are likely to occur in the text frequently (e.g., *proto-, zygo-, zo-, meso-, lysis),* as well as root words such as *plasm,* and show the students how the terms derive their meanings from the elements of which they are composed. Once the elements are known, it is often a relatively simple matter to analyze the words in which they appear. For instance, once the meaning of the word *lysis* has been made clear, words such as analysis, hydrolysis, electrolysis, proteolysis, lysosome, and paralysis can more easily be learned and retained. Again, the name of sugars end in *ose* and the names of enzymes end in *ase.* Once this matter is made clear to students, they are able to recognize the chemical similarities of glucose and ribose, and they know that amylase and lipase function as organic catalysts.

Of course, scientific terms are rigorously defined, and their meanings must be mastered with precision. The use of Greek and Latin word elements is just one useful aid, though a major one. Probably the single most significant aid to students in mastering vocabulary is the precept and example of the teacher. If he is willing to tolerate slovenly syntax, that's what he will get from the students. If he uses terms loosely, the students will come to believe that scientific vocabulary is vague, and their thinking will suffer from it. If he doesn't understand the importance of precision, how can he expect more from his students?

Early in the fall I spend considerable time calling the Greek and Latin word elements to the attention of the classes. I give impromptu drills on spelling and pronunciation and meanings. This work gradually decreases and then stops. Only when lapses appear to have occurred do I resume it. After about two months, I shift to a more cooperative system, in which the students are encouraged to take the initiative in bringing up terms for discussion. They often trip another student on a term he uses vaguely or incorrectly. By this time they have started to record, on their own initiative, terms which have appeared in the text or during discussion.

At this point I start to use terms which have appeared in recent assignments but about which no specific discussion has been held. If students can handle these terms and not appear bewildered when they are mentioned, I feel that they are off to a start on the road to independence in learning scientific vocabulary. It does not work for all students, however, and so I must still return to drill-work with those people. Still, most students, once they have been introduced to word elements, can deduce many meanings with fair accuracy.

Because of the heavy vocabulary load in scientific writing, I try to help students realize the need for adjusting rates of reading. I try to make them aware of the fact that different densities do exist; that, just as one does not approach reading an article in *Life* with the same technique as reading an article in *Scientific American,* so one must treat the reading of different sections of the same textbook. A long expository paragraph with several difficult concepts and much technical jargon simply cannot be read so rapidly as an easy, general introductory paragraph. It's a physical impossibility. I locate two such paragraphs or sections and have the students read them. I then ask, "Which of these would you say was more difficult? Why?" After discussion of the characteristics of the two paragraphs, the students see what is meant by "reading density" and understand why speed adjustments must be made.

Work with the Reading Consultant

Our reading consultant keeps data on students' reading abilities and gives packets of cards with this information to teachers in the fall, one card for every student on a class list. I was interested in having such material early and sought her out. From this initial contact, we gradually evolved other projects.

For example, many of the students were coming to laboratory sessions unprepared. They didn't know what to do or how to do it. Even though the material had been assigned to be read the night before, they couldn't seem to get the procedure down in their minds. We have only fifty minutes in which to carry out a laboratory procedure, so any time used for reading the procedure is time lost in doing the task. I talked to Miss Thomas about the problem and she suggested producing a large poster for the classroom which would detail a reading approach to the laboratory and, hopefully, would increase efficiency. We also decided to produce notebook foldouts for the students since their reading is done at home and they need something to refer to. We copied what I considered to be a typical procedure, containing the elements likely to be found in all such procedures, and attached instructions pointing out the necessity for careful reading. It has worked beautifully, in most cases.

The materials are given out during the first week of school and gone over in class at least twice. I introduce the idea of time limitations and the necessity of laboratory efficiency; I then go through the prelaboratory reading procedures with the students in detail. A day or two later, I review the highlights.

The many students who have followed the guidelines on the foldout are confident, efficient, and pleased with their results since they can work steadily, yet not hurriedly, and do not get lost in the process of working. They do not have to correct as many mistakes but can proceed smoothly and without much pressure. The few who started out by ignoring the outlined reading procedure became confused and pressured enough to have to start over, or found themselves wasting too much time, or frequently found they could not complete the work at all. The truth became evident to them, and the vast majority of these doubters reformed their reading procedures before many sessions had passed.

Periodic reminders to follow the successful procedure must be given, though with decreasing frequency, as the first semester progresses. Once a student has panicked under the stress of not being prepared and has seen that this stress can be nearly eliminated by following the procedure, he serves as his own moving spirit. The long range result of our project has been more efficient laboratory sessions and a saving of countless hours of working time.

Reading: A Hot Issue for a Cool Librarian

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YEARS AGO, AS A LIBRARIAN, I would have been greeted unquestionably by teachers as a blood brother. I do not feel quite so secure today. For in the past few years our libraries, once the haven of the printed word, have disappeared, at least in name. My colleagues everywhere now preside as media specialists over "materials centers," where we dispense "hot" and "cool" media in "wet" and "dry" carrels to what we hope are "hot" and "dry" kids. And we try to keep our cool in the midst of increasing McLuhanacy. But fear not. We have not all been lost to your cause forever, at least not this librarian. For I must confess to you that I am a "pusher," in that most lucrative of markets—high school. And what I push is a drug, a wonder drug if you like: books. Oh, I may push a slide or a piece of sculpture now and then and as advisor to the film club I must admit that I do push the movies every week, for which I hope you will forgive me. But I really push books. And my occasional successes in this pushing are what I shall discuss with you.

The question of success or failure for us all in our field of education may be said to hinge on a very crucial balance which I found stated recently in an article in *Saturday Review (2)* entitled "When Learning Comes Easy":

> If the discrepancy between what the child knows and what the environment offers him is just large enough, according to Piaget, the result is pleasure; if the discrepancy is too large, the result is distress. A logical corollary . . . would seem to be that if there is no discrepancy at all—if the environment offers a youngster no possibility for learning—the result is likely to be boredom.

I believe that we may apply this statement to what a student can read, as well as to what he knows. Whatever success we librarians may have with our students and books has come from our ability to strike that balance, to hit just the right amount of discrepancy with as many students in each working group as possible.

We have an invaluable set of tools to help us in our efforts, and these are the tools provided for us by our reading consultant: the charts showing the distribution of reading levels for each grade level class and the instant reading file which contains a card for each of our students with many items of interest to assist us in helping them. But even with these tools there is another element for success, and one that I think you need as much as we do. You need a faculty willing to work with you, to let you help them do a better job of establishing the kind of environment most conducive to each student's learning. As service people, we are basically dependent on being allowed to help; without clients we have no function. So the second request I submit to you now is to please ask your teachers—beg your teachers—to work with you and your librarians. The students cannot possibly lose, and the possibilities of gain are limitless.

Pleasure Reading

Now that we have set up an ideal situation—a library staff informed of the reading abilities of the students and a faculty ready to consult with the staff and use its knowledge and abilities—how do we help our students become more effective readers? In our library we try to help students by working simultaneously in the areas of reading for pleasure and that of reading for class assignments. Let us first discuss pleasure reading in this day of increased homework pressure plus competition from TV and films, this old-fashioned pleasure seems to be one of the first to go. No march to the library for a library period, no forcing him to check out a book; not even a required book report ever made any student read—at least not past the blurb on the jacket. How then do we get young people excited enough about books to want to read them, even demand them to read? First of all we get *good* books, really good ones related to students and their experiences, ones that we can recommend with genuine enthusiasm. We make the books as attractive and inviting as possible covering new dust jackets with plastic and rebinding shabby books. And then we go beyond merely having them around, we "push" them. We peddle them as if they were the proverbial hot cakes getting cold, with the real excitement we feel because we care.

And the best place to push, we have found, is the classroom, the area which brings us back to the help of the reading consultant. First of all, we go into a classroom knowing what the students in that class can read. It is mainly in English classes that we do our pushing, although we have done it for general interest materials in the sciences for science classes. We enter classes armed with the knowledge that helps us choose books with the right discrepancy mentioned above: not so great as to cause distress or disinterest, not so little as to cause boredom. For example, we could tell from the unusual pattern of reading levels on the profile for this year's seventh and eigth grade classes that there would be more than the usual number of readers not yet ready for high school reading level materials. So we made a special effort to bring students the animal, fantasy, and science fiction books at their level until they were ready for more challenging material. We have found that once we are invited into a class and have prepared what that class really needs, we have little difficulty beyond getting out of the way to avoid being trampled in the rush for the books once we finish our sales pitch. But it really helps to be invited in by a teacher who believes in reading for pleasure.

Beyond attractive displays in the library, the English classroom serves also as a place for the quiet sales pitch. We have worked with English teachers on a selection of paperbacks—titles we can't get enough of in the library—for areas such as Fader (*1*) suggests to get students "hooked on books." Books from this browsing type area do get borrowed and presumably read.

Fulfilling Assignments

But let's move on to the area of school assignments since every student we wish to help is grappling with these problems every day, and we all see the unhappy results when he is unsuccessful. I think we all agree that we must help teachers move beyond the single standard text in our effort to find that proper balance, that right discrepancy for each learner. Our teachers in most areas no longer use a textbook, and our reading consultant can certainly take some credit for this. But I am sorry to say that not all of our teachers go as far as they might to meet the needs of each individual student.

First, let me give you an example, for contrast, of how *not* to give an assignment. I will use a recent, actual example. A question or problem is passed out to students. A list of sources to help solve this problem is also distributed. The teacher, well-briefed by Miss Thomas, has, we hope, checked to see whether the students in his class are all equipped to read at least some of these sources—or has he? One thing is sure: he has not checked to see whether any of these sources are in our library. We don't even know what he and his class are up to. I think you know what happens next. The first few students through the library doors grab off the shelves whatever books we do have on the list, regardless of whether these are the best books for them. The rest of the students find nothing, are frustrated and discouraged before they begin, or are forced to go all over the town looking. Other fine books on the subject which we may have waiting to be cataloged will never be used. Books already on our shelves but not on the list may be searched out by the brighter or more persistent students or may not be found at all. And, of course, all our efforts to learn the reading abilities and interests of the students so that we can help each to find the materials on his level cannot be used. By the time some student passes the assignment on to a librarian, it is usually too late to do much.

But let's leave this dismal picture—it is one that I have viewed with variations too many times—and move to a brighter and more productive one. Let me paint for you the bright, encouraging picture of the kinds of projects we feel are productive and successful, partly at least because the librarian and teacher worked together with the help of the reading consultant to plan for the benefit of the student.

The first step, planning the assignment, is usually done in the teacher's mind. But once the assignment begins to take shape, he is already thinking in terms of materials, and this point is where we like to start our part of the job. Teacher and librarian, working with the class's reading profile in mind, can begin to discuss what the students can profitably use to solve the problem the teacher will pose. If students help with part or all of the planning, the questions remain the same. If these are seventh to eighth graders, will we need to borrow materials from the elementary library to have enough for the slower readers? Do we need to order additional materials? How about some filmstrips or slides for the less verbally-oriented students? If this is an older group, will we need to borrow additional materials from the university library to challenge the students? Will the class have to use any special tools that will be new to them, such as statistical tables or an atlas? If so, the librarian will prepare for this. Depending on the amount of materials available, the teacher, librarian, and students work out the fairest method of distribution (reserve, one week circulation, etc.).

Now that the materials are being made ready, it is time for a decision on how to give the assignment so that each student can find the materials best for his solving of the problem. Sometimes we have found it best to bring the materials into the classroom where the teacher and/or librarian can work with the students individually to guide them to their best sources. Sometimes, instead of or in addition to this, the librarian will prepare a bibliography with annotations, not only of what the materials cover but also with such key words as *readable, popular treatment, scholarly,* and *highly technical* to help the student find books on his reading level in that subject. Now is the time for the librarian to review the *Reader's Guide,* if magazines will be used, or to remind the student of cross-references if he must use the card catalog as part of the assignment. All librarians ideally have been alerted to the assignment in progress and know exactly how much help they are to give the students and even what kinds of questions they may use to help students begin to find the answers by themselves.

Our ideal assignment concludes with a joint evaluation by teacher and librarian (and usually students who are, in our school, quite free with their opinions). Here is where we discover that we need more copies of a book which so many found just right; or that a few poor readers never did find anything they could use to solve the problem, a condition indicating a need for easier-to-read books or perhaps a different kind of problem if there are similar poor readers next time; or that perhaps more than half the class still can't handle the *Reader's Guide*. Next time. . . .

As a final word on teaching reference skills, it is my firm conviction, based on both experience and some research, that teaching reference skills by itself is an impossibility. What we can do, and I believe with some success, is teach students the skills they need to tackle a particular problem at the time they need to solve it. As an example, we had tried to teach the *Reader's Guide*. Some students learned but most didn't. But when their science teacher requires them to use periodicals for their report on contemporary problems such as air pollution or LSD, then we move into class and are listened to. Almost all students then use the guide without difficulty. The few who still can't are easily identified and are either helped individually or given our program on the guide. Before I talk about our programs, I simply want to reemphasize the importance of learning reference skills at the time when they are needed to solve an immediate problem. Again with cooperation between teachers and librarians, and an assist from the reading consultant, assignments can be planned so that all the skills agreed upon can be developed as the students progress through high school, not in isolation to be quickly forgotten but in context to be used and reinforced later. Because of our school's commitment to independent learning, we have developed a first draft of a library skills test which we believe tests the skills our students need to function as freshmen. Students take this test on their own and grade it themselves. According to the questions missed, they are directed to programs which we hope are self-teachers of the skills needed. Of course, many students will only take the test or use the programs when motivated by class assignments.

Whether it's simply "What's new and good for me to read this weekend?" or "Which of these should I take home tonight for that problem on the Middle Ages?" we librarians must, if worthy of the name, be able to answer. If we have done our homework, we know that Jane is in the reading clinic and having difficulty building speed and comprehension. So we can say with conviction to the latter question, "Take this one. It will really help you answer the problem," or to the former, "*Junie Moon* just came back. I think you'll enjoy it." But if Joe, whose scores show he reads far beyond what that cherubic face suggests, asks us the same questions, we're apt to tell him to try *The Stranger*, since he enjoyed the film, and then move him to Kafka and on to the challenge of a book from the university library for the same assignment as Jane's. Hence, the twofold responsibility of the library—helping students with pleasure reading and fulfilling assignments—becomes part and parcel of the total reading program of the secondary school.

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PART TWO

A Framework for Improvement

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TEACHERS of subject matter at all grade levels are facing some of the severest challenges that education has encountered in this nation's history. Granted, some of the factors that are changing the total concept of teaching in the content areas are beyond the control of classroom teachers, but the impact, direction, and forcefulness of others can be directed toward more positive goals. The adequate teaching of reading in the content areas can have a direct influence on many educational problems.

When one visits secondary classrooms, it is not unusual to find that from 30 to 40 percent of the students are unable to read the assigned textbooks. In some classes teachers are aware of students' deficiencies in reading but do little or nothing to alleviate them. These teachers do not hesitate to say that such students should not be in their classes. In other instances teachers make efforts but are frustrated because they do not know how to help the less efficient readers other than by lecturing or reading the textbook to them. Several teachers I observed had recorded the entire textbook on a series of tapes. Lectures and reading the text to students may be useful and helpful at the time, but such techniques treat symptoms of the problem rather than the problem itself—the need to teach students how to read.

Many inefficient readers enter universities, colleges, and junior colleges. In four-year institutions a few receive help in reading and eventually are graduated, but most either drop out or fail during their freshman year. Those who enter two-year colleges are often more likely to receive some help in reading, since administrators of junior colleges appear to be more sensitive to students' needs and cognizant of reading problems.

Many students who experience difficulty in learning, regardless of the reasons, are developing unhealthy attitudes toward teachers and education. No doubt some of their belligerent criticism and cynical disbelief is partially due to their inability to read and learn in content areas. If this is a valid appraisal of the situation, teachers should make every attempt to remedy these deficiencies.

There are, on the other hand, many excellent teachers doing an outstanding job in meeting the needs of their students. Although few of them realize it, they are using techniques of reading to improve student learning in content areas. Students in such classes are often unsure and confused by conditions in our schools and communities, but they rarely are so emotionally upset that they develop unhealthy attitudes as other students do. Although they may be critical of certain educational practices, they use positive approaches in attempting to change such practices. One of their techniques is to ask numerous pertinent and relevant questions. Instead of always providing answers for such questions, competent, understanding teachers direct such students into reading specific materials which will enable them to reach their own conclusions based upon facts rather than emotions. It is this kind of teaching and learning that is essential for all students.

Content area teachers do not always take kindly to the proposal that they teach reading in their areas. Some flatly reject the idea and refuse to give it further consideration. Others ask, "Why can't the English teacher or a reading teacher teach students to read and leave the teaching of subject matter to me?"

An answer to the content area teacher's question is that there have been numerous and various kinds of programs developed to improve the reading skills of inefficient readers. The emphasis of many past programs has been on helping the severely retarded reader. This kind of program has value, but it is the most costly of reading programs and involves a minimal number of students. The present trend is also to provide help for the corrective or less seriously retarded reader. Few of these programs have led to appreciable improvement in reading in the content areas. Probably the primary reason that these programs have not significantly improved students' reading in subject matter is that they are designed to improve basic reading skills that are only prerequisite to reading subject matter efficiently.

Reading is not a subject; it is a highly complex, purposeful thinking process that is developmental in nature. The process of learning to read has its beginning in the primary grades, but it is only a beginning. Reading is never fully mastered by even the most competent of students.

Because reading has no subject matter of its own, whatever the reader reads is reading. It matters little whether he is reading a newspaper, a magazine, a menu, or a textbook; he must read something. The efficiency with which he reads depends greatly upon 1) his basic reading skills, 2) his background of experiences in the area in which he is reading, 3) his interest in the material, 4) the difficulty of the material, and 5) his purpose(s) for reading.

Before a student is capable of reading efficiently in a content area, he must have developed certain minimal basic reading skills. If he is lacking in any of these basic skills, he will have difficulty in learning subject matter by reading; and there is little that the content area teacher can do to help him. The basic skills include the following:

- An adequate sight vocabulary of the most common words in English.
- Word recognition and pronunciation skills.
- The ability to use a dictionary independently and successfully.
- The ability to follow written and oral directions.
- An understanding of the meaning of a large number of vocabulary words.
- The ability to get meaning from what is read.
- The ability to organize mentally and to outline material read so that he can recall and use it when needed.
- Some knowledge of how to establish purposes for his reading.
- The ability to adjust speed of reading according to his own experience and to determine the reasons for his difficulty in the material he is reading and his purposes for reading it.
- The ability to use the index, table of contents, glossary, and author's clues found in a textbook.
- A knowledge of when to use additional reference materials.
- The ability to use the library and its reference materials.

The fact that basic and general reading skills will transfer from one content area to another means that an efficient reader in one area is more apt to become an efficient reader in another area than is a less efficient reader. The transfer, however, is not automatic, and simply because a student is an efficient reader in one area does not guarantee he will be so in another area. You can test the validity of these statements by trying to read quantitative analysis, a medical report on the functioning of the brain, or the nature of crystals. Unless you are proficient in the content of mathematics, medicine, and geology, you are certain to be as confused and bewildered as many students are in your content area.

The content area teacher is, first of all, an expert in his own field. He has developed a vast background of experiences and knowledge over a period of years. He knows the language, the vocabulary, and the concepts of his chosen field better than any reading teacher. He can best make these experiences and this knowledge meaningful to his students. As long as he uses written materials as aids in teaching subject matter, he has an obligation to teach his students how to read that subject matter.

It is understandable why content area teachers object to teaching reading. Few have taken a single course in how to teach reading. Teacher education institutions deserve to be censured for this neglect in these teachers' education. Nevertheless, content area teachers are faced with the problem of teaching reading in their own fields.

Five Steps to Reading Improvement

If content area teachers will make use of the following suggestions, they will be performing an invaluable service for their students. Teachers will also be agreeably surprised at the changes that take place.

- Obtain a reasonably accurate idea of each student's reading level.
- Provide each student with reading materials at his own instructional level.
- Prepare students to read the assigned materials.
- Give additional help to those students who need it while they are studying.

- Ask questions that are based on vocabulary, facts, and inferences.

Step 1—Determining reading levels

Although standardized tests have many valid purposes, they should not be used for determining students' instructional reading levels. Reports by Betts (*1*) and Marksheffel (*2*) indicate that standardized tests of reading tend to place a student anywhere from one to four grades above his instructional reading level. (The student's instructional level in reading is the level at which he is sufficiently challenged but not frustrated by the difficulty of the material. At this level he should be able to pronounce 95 percent of the words and comprehend at least 70 percent of what he reads.)

A group informal reading test will provide teachers with a reasonably accurate instructional reading level for each student. It is not so accurate as an individual informal reading test, but it will serve the content area teacher's needs quite well. It is relatively easy to develop and requires only about 20 minutes to administer.

Preparing a group informal. Select an interesting, representative sample of 400-500 words from a regularly assigned textbook. Based on the sample, develop at least ten questions that will measure the student's understanding of what he has read. The questions should follow the sequence of the selection. The questions should be of three types: fact, vocabulary, and inference. (When possible, it is best to use about the same number of each type of question.) A duplicated copy of the questions should be prepared for each student with sufficient space between questions for the written answers. Yes and no questions and true-false questions should be avoided.

Students should be prepared for the reading by a brief explanation of what the inventory is about and by giving them several purposes for reading. After the students have completed reading the assigned material, they should close their books and answer the questions.

Interpreting the test results. The teacher can be reasonably sure that those students who answer at least 70 percent of the questions are capable of reading the text at this time with a minimum of teacher help. Students who score between 55 and 65 percent should be tested further at this level since some of them will probably be capable of reading the material with additional help from the teacher.

Students who score 50 percent or less are probably overwhelmed by the difficulty of the material and should be tested on selections at a lower reading level in this same manner. For the sake of expediency, students who received from 55 to 65 percent may also be tested at the next lower level. Testing at succeedingly lower levels should continue until a reasonable estimate is obtained of each student's reading level. In the secondary school it is rather meaningless to go much below the fifth grade level. Students who are unable to read at about fifth grade level rarely are able to learn to read at higher levels without the individualized help of a thoroughly prepared reading teacher.

Step 2—Providing materials at instructional reading levels

Content area teachers often find it difficult to break the habit of relying upon a single textbook for instructional purposes. Their main concerns and objections center around three specific points. First, they cannot understand how it is possible to test students unless they are all using the same textbook. Second, they are at a loss as to how to obtain lower level books. Third, they are concerned about embarrassing students by giving them lower level books. Some feel that other students may make fun of those who are the less efficient readers.

Most of the teachers' concerns are really not so complex as they may appear. Testing is no more of a problem when students are reading different levels of books than if they were all reading in the same general area. A teacher obviously will not and cannot have one group studying about early colonial days, another studying the westward movement, and still another studying about the framing of the Constitution. This diversity is too much to ask of any teacher. But when students are all studying in the same general area, an essay type test will give some indication of what each student has learned regardless of the reading level of the material. Teachers who prefer objective type tests may use questions that are common to all the materials and make them increasingly more difficult as the test progresses. Such a procedure will provide the less efficient readers with a chance to answer a number of questions, and it will also challenge the more capable students as they continue the test. A grading differential will need to be worked out.

The second concern of teachers, that of securing different levels of textbooks, poses a more difficult but not unsurmountable problem. There are an increasingly available number of good textbooks being published that will provide different levels of readability. In addition, there are numerous supplementary books, paperbacks, magazine articles, and newspapers. One invaluable way of obtaining material that should not be overlooked is through the service of the librarian. Librarians will do the almost impossible when it comes to getting materials for teachers and students.

The next time the teacher has an opportunity to order textbooks, he should take advantage of the opportunity to procure books of various levels of reading difficulty. An example of an order for books for 35 students might be 18 to 20 textbooks at the ninth grade level, 8 to 10 at the eighth grade level, 7 or 8 at the seventh grade level, 5 or 6 at the sixth grade level, and 3 or 4 at the fifth grade level. Several texts should also be purchased at the tenth, eleventh, and twelfth grade levels in order that the more efficient readers be given materials that will challenge them and help to develop their reading and learning skills. Too often students who are capable of a higher level of learning are allowed or forced to work at the average class level. Such a practice is a disservice to students and can be detrimental to their learning.

Teachers often worry about administrators objecting to this kind of a book order. In some cases, administrators may refuse to honor such an order, but the only way to be certain is to go ahead with the order. Most administrators with whom I have talked about procuring multiple-level texts for their teachers have agreed that the idea is sound even if it is slightly more expensive than ordering 35 copies of a textbook. Administrators frequently say that they order single-level textbooks in the content areas only because that is what teachers request.

Teachers are often concerned about students' being embarrassed and upset if they are given books that have a lower level of reading difficulty than do the regularly assigned textbooks. Students, with rare exceptions, are agreeably surprised and elated when they are given books that they can read. They are no longer condemned to continual failure in content areas in which reading is an important part of the learning process. If teachers only knew that oftentimes the difference of but a single grade level in readability of textbooks may be the difference between success and failure for students, it is certain that more of them would use more than a single textbook in their teaching.

Step 3—Preparing students to read assignments

The assignment period is the perfect time to prepare students for learning. Here the competent teacher insures successful reading by giving students some guidance in what to read for and how to read. He usually makes sure that students understand certain new and difficult key vocabulary words by writing some of them on the chalkboard and then pronouncing them clearly and accurately. He provides time for those students who know the meanings associated with the new words to define and discuss them for the benefit of those who lack meaning for the words. Such practice not only aids the students to whom the words were meaningless but it also provides the more efficient readers with an opportunity to practice putting their thinking and knowledge of words into spoken symbols.

During this period the teacher also furnishes students with any needed background information that is necessary for their reading. In addition, he gives direction to the reading by asking students questions about the material *before* they read it. As a result, their reading becomes purposeful and more meaningful.

Step 4—Additional assistance

If students are reading at their own instructional levels, there will be a minimum need for teacher help. They should, however, know when to seek the teacher's assistance.

Step 5—Questions and discussions

After students have completed their reading, they should have acquired a certain amount of learning that needs to be reviewed and reinforced. By asking questions, the content area teacher sets the stage for active student-teacher discussions. When students disagree with one another's interpretation of the material being discussed, an opportune time exists to teach students how to quickly locate the disputed material and reread it aloud for purposes of clarification.

While students are actively engaged in discussion, the teacher may and should evaluate each one's contributions, including his own.

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Reading in the Content Areas: Specific Procedures

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READING during the years of secondary school entails the use of many reading skills that were not needed in elementary school and many which cannot be taught before the student reaches high school; therefore, it is very important that planned, directed reading lessons be continued throughout the junior and senior high school.

It is often repeated that all teachers should teach the reading which is required by the content area in which they teach. There can be no argument with this statement; however, rarely are content area teachers prepared to teach reading, as Marksheffel indicated in his paper. One can have a secondary teaching certificate in most states with an English major and still not have had one course in the teaching of reading. If this condition is so in the field of English—the area often given the responsibility for teaching reading skills—how can one expect the teachers of social studies, science, mathematics, home economics, or art to become teachers of reading? The teaching of reading is as much a skill as is the teaching of any other subject, and teachers should be trained to teach it. All prospective teachers, regardless of the subject they plan to teach, should be required to take at least one course in the teaching of reading before they are certified to teach, in order that they may understand the complexities of the reading process and be prepared, at least partially, to handle the reading problems that confront their students.

With such little training, it is no wonder a teacher does not know where to start. Probably the best way is to begin in the areas where students show weaknesses. By means of informal tests and inventories, based on selections from the books the students are expected to read, the teacher can learn a great deal about each student's ability to read the content area material. Also, available to teachers are the verbal scores on standardized tests. If the school counselor has a master chart of these for teachers' use, hours of perusing cumulative record folders will be saved.

The most important general skills needed for comprehension in high school can be divided into the following areas:

- Workable vocabulary of about 10,000 words.
- Reading at rates appropriate to the purposes for which material is being read.
- Skimming to obtain an overall impression of the whole.
- Scanning to locate a particular fact.
- Understanding maps and graphs.
- Organizing material.
- Comparing points of view in order to see all sides of a question.
- Drawing conclusions from the facts given.
- Understanding the use of figurative language.
- Communicating with the author as an active reader.

Planned exercises, using the student's textbooks, should be given in each of the general skill areas by each content area teacher, either as refresher material for the students or as new skills.

At least one-third of a heterogeneous class generally finds textbook material too difficult to read. With a planned reading program this figure could show a significant drop. By incorporating these skills in the classroom, teachers will find that students gain a better understanding of content area material as well as the skills needed to become independent readers. Any teacher who has prepared a student to proceed independently after leaving the classroom has been a successful teacher.

A teacher should also familiarize himself with the scope of all instructional materials before the start of the school year. He should decide what background of experiences is necessary for students to understand the materials; what study aids are given by the authors (i.e., index, glossary, charts, appendix, boldface headings, italics, chapter introduction, summary); what word recognition skills will be needed to handle the new vocabulary (i.e., which prefixes and roots are often repeated in the subject vocabulary); and what reading skills will produce the best understandings of the materials. Basically each teacher should know intimately most of the instructional materials in which he plans to involve the student.

A skillful teacher builds his assignments to serve a double purpose: to produce the content area learnings he desires and to develop the reading skills needed by his students. In making an assignment, a teacher should be explicit as to the *purpose* of the assignment (i.e., answer specific questions, develop an outline, find the author's views, contrast opinions on a subject, consider specific issues in the light of the student's present knowledge). The meanings of key vocabulary words and experiences should be discussed before the chapter is assigned. Students should also be given an opportunity to discuss the best reading rate for use in the assignment. Efficient reading can become a habit if directed reading is a part of each assignment.

Knowledge about trade and reference books available in the content area under discussion can provide the teacher with an important additional tool. The interests of the students within a subject area classroom should be determined informally or by means of an inventory. Themes could then be chosen, and students could be given a wide choice of books to read. Whatever the students' interests appear to be, a wise teacher will build collateral reading around them. After reading books dealing with one theme, the students will have the opportunity to compare ideas of different authors in relation to those of the class. The exchange of ideas gained in class discussion makes reading meaningful to students. Students rarely resent "outside reading" if they find it of interest to themselves in their world and if the reading level is within their grasp. If a continuing interest in reading is developed, this may well be a more important outcome of instruction in any of the content areas than the accumulation of facts.

Classroom-Proven Techniques

The following sections present techniques that have proven successful in the classroom. Some are specific skill development procedures while others deal with related reading and students' reading interests.

Teaching Reading in English

Reading for details. In Poe's story, "The Tell-Tale Heart," the author leads one to believe the main character is insane. State the clues given to support this belief.

Character interpretation. Read a short story and describe the character of one of the persons in it. Be prepared to give evidence for each characteristic mentioned.

Promote interest in books. Have students "sell" a book to the class. After presentation, have students discuss why they would or would not want to read the book.

Predicting events. From the description of the country and climate in which the characters live, state the kind of people you expect them to be.

Use of diagrams for organization. By means of a diagram, show the relationship of different incidents in the story.

Research project. Prepare imaginary interviews with authors of the past as a means of motivating an interest in literary biographies. Students can participate as announcers, interviewers, and authors being interviewed. They can prepare bibliographies of sources used to obtain information.

Finding main idea. Send a telegram repeating the events of a crucial scene in the story; keep the cost low.

Use of paperbacks. Remove each chapter of a paperback; give each to a different student. Have each student report on his chapter in class. In one day an entire book can be reported on.

Understanding characters. Read a story to the point where the characters are to speak. Have each student write his own dialogue for the incident. Compare results in class. Which comes closest to the author's interpretation of character?

Effective use of words. Underline colorful words, expressions, and sentences. Use these in original sentences and paragraphs. Substitute synonyms for these words. Are sentences as effective?

Teaching Reading in Social Studies

Research. Use a number of different books to find the causes of our Civil War. If possible, compare books printed in the South as well as the North. The same might be done on the American revolution; it is interesting to read the English statements of causes.

Cartoons. Find material in the textbook which gives the background of a cartoon.

Vocabulary. Read a newspaper article on a controversial issue and underline the words that present a favorable or unfavorable reaction to the issue.

Main idea. Remove the headline and first paragraph from a news story. Have students read the article and prepare the missing parts. Compare with the original.

Word signals. Underline words the author uses to signal time (*before, then, after*), continuing thought (*also, besides, in addition to, for example*), comparison (*however, nevertheless, on the other hand*), and conclusions (*therefore, as a result, for this reason*).

Graphs and diagrams. Prepare a table of imports and exports of a country. Conceal the name of the country. Students should work together to find the size, location, and natural resources of a country with the given volume of exports and imports. With the proper discussion the name is revealed.

Propaganda. The use of words to influence attitudes and motivate actions is most clearly seen in advertisements. Have students bring a number of these to class for analysis.

Teaching Reading in Mathematics

Vocabulary. Underline words or phrases in a problem that are to be converted into mathematical symbols. Place symbol above the word.

Teach students meanings of common prefixes, suffixes, and roots used in mathematics: *mono*mial, *bi*nomial, *tri*nomial. Relate these to words already familiar to students: *monorail, bicycle, tricycle.*

Sentence patterns. $1 + 3 = 4$ is a sentence expressed in mathematical symbols. In word form this sentence would read: one and three are four; or one plus three equals four.

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—22 is an incomplete sentence which may be expressed as follows: seventy-seven minus twenty-two is ____; or, twenty-two from seventy-seven is ____.

Audiovisual. Have number facts on posters around the wall. Allow students to refer to them in order to concentrate on the problem rather than arithmetic. Students also find memorizing these facts painless as they let their minds drift off the subject under discussion.

Problems that can be visualized become real to students. Whenever possible, have them sketch the situation and facts given in word problems.

Have students think the problem aloud for recording on tape. On playback have students listen for misinterpretation of printed word.

Reading arithmetic or algebra problems. The following steps should help the student "read" the problem: 1) read rapidly to get the general idea; 2) read again to find relationship of facts; 3) read again to check figures and relationships.

Students should ask themselves the following questions: What facts are given? What questions are asked? What mathematical steps are needed for solution? What should the approximate answer be?

Teaching Reading in Science

Vocabulary. In scientific definitions and laws, underline the qualifying words, the descriptive words, and the phrases that narrow the application of term or law defined. Put definition in your own words.

Research. Find advertisements in magazines which are a direct result of the invention of______________.

Use several sources of information for a research problem. For each source include the answers to the following questions:

Why is this information reliable (or unreliable)?
Who said it? Who is or was he?
How recent is the material?
Are all your sources in agreement? If not, what differences are there?

Processes. Given a verbal description, draw a diagram explaining how ______________ works (refrigerator, water wheel).

Character. Read about the inventions of ____________. What qualities can you find in ____________ which led him to make these discoveries?

Sequence. List chain of events leading to a specific scientific discovery (anesthesia, X-ray).

Survey. At the beginning of the year have students become familiar with the study aids in instructional materials (chapter summaries, boldface print, italics, appendix, glossary, index).

Teaching Reading in Home Economics

Critical Reading. Collect articles and advertisements on a variety of reading levels. Have students evaluate them for fact versus advertisers' claims.

Directions. Have students read instructions on care and use of washing machines, dryers, and stoves. Students are to follow directions and perform required tasks with the teacher only aiding in the reading of instructions.

Visualization. Have students match recipes with pictures of finished product.

Details. Read labels on cans and boxes to discover best buys and note ingredients. Research in this area can be productive not only for information, but also to improve the noting of details.

Teaching Reading in Industrial Arts.

Visualization. Place the picture of a house on a bulletin board. Below it place four different blueprints of floor plans. Find the blueprint which matches the house.

Interpretation. From a carefully written description of a house, draw a blueprint for it.

Critical reading. Compare various points of view. Have students find material about trade unions, for example. Use several different sources. The discussion which follows makes reading "real" to the student.

Sequence. After students read the specifications for a simple task, ask them to close their books and write down, step by step, the processes involved.

Follow the activitity of a company throughout the year on the financial page of a newspaper.

Interests. Students should read current events, politics, industrial relations through the eyes of the working man.

For a reading program to be successful, the teacher must have confidence in what he is doing as well as a strong belief that what he is doing is important to the students; therefore, basic to teaching reading in the content areas is a compulsory reading course for new teachers as well as a training course in basic reading skills for veteran teachers. Knowing the "what" and "how" of reading will enable each teacher to provide definite, systematic training in the reading skills needed by the students in the class. Students who do not respond to such basic teaching will become candidates for the reading specialist. But guidance in reading in the content areas will most often result in high returns which far exceed the general expectations of the content area teacher.

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Reading and Vocational Education

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IF THERE IS any one thing certain in the reading of material in practical subjects, it is that no teacher other than the "practical subject" teacher can get the job accomplished. It is indeed ridiculous to expect or assume that a reading teacher, English teacher, or anyone else can intelligently deal with the skills and content of the practical subjects. The purposes, the motivation, the application—all are significantly different.

The Status Quo

The emphasis on secondary reading programs that began in the early 1950's led many educators to believe that a "course" in reading would solve the reading problems encountered in all academic and nonacademic classes. It was assumed that the skills learned in a concentrated reading program would somehow transfer into the content areas. When someone finally got around to challenging this concept, it was found by observation and research that the transfer did not, in fact, occur. It was further discovered (one must wonder why it had to be discovered) that the reading skills, needs, and purposes differed from one content area to another.

It is unfortunate that the overwhelming negative evidence has had relatively little effect on secondary programs. Of course, great gains can be demonstrated on pre- and post-standardized tests; but these results are quite misleading. A standardized reading test is certainly no measure of specific reading skills needed in the reading of literature, science, or industrial arts. A standardized test is as irrelevant to reading in the practical subjects as a student's size, color, national origin—or what he had for breakfast. Yet, secondary reading courses are still being justified on the basis of standardized test gains.

A Perspective of Reading Programs

It is my contention that the action is in the classroom; that reading is a process, not a subject; and that relevancy of reading and classroom instruction is the key to successful and efficient learning. Perhaps this position can best be exemplified by a comparison of two articles in a recent volume of *Industrial Arts and Vocational Education.*

Article one, by James D. Marsh (*3*) is entitled "Memphis Tried a Vocational Special Needs Program." Marsh alluded to a concentrated, individualized, two hours per week program aimed rather specifically at increasing reading ability. Unfortunately, he did not describe the content of the instruction that took place in the program. He did, however, mention that the teachers were all women.

Marsh's subjective evaluation of the program was very positive. Objective measurement showed no change in the criteria measured.

In all due respect to Marsh and his associates, it would appear that Memphis has probably wasted a good deal of time and money on a program which was doomed from the start because it was based on the erroneous assumption that a student learns skills (reading, in this case) in one place and applies them in another.

Article two, by R. L. Betterini (*1*), is entitled "Insulated Ice Bowl Mass Produced." This article was relevant to reading, practical and realistic, and the results were very apparent to the teacher and the students.

Betterini began with excellent readiness; his class assumed a corporate structure. They then planned to mass produce a product. The students decided on an ice bowl. By dividing into appropriate groups, they planned what was needed and how to accomplish it. They researched the materials, the processes, and the alternatives and presented their findings to the class by using production charts and graphs. Reading widely in many resource materials, students searched for answers to pertinent questions; such as "What wood will be best from the standpoints of beauty, cost, and production?" and "What metal will be best for insulation, cost, and production?"

Not only did the students research and develop the production of an ice bowl, they also researched and studied the effect of such production on their locality! Betterini wrote

> Recognizing that the product is not an end in itself . . . an attempt has been made to depict an industrially manufactured product in a sociological setting, utilizing materials, tools, and industrial processes which have evolved from our present day technological society.

Now *there* is a reading program!

Responsibilities of the Teacher

If content area reading can or should take place in practical subjects, what can the practical subject teacher do to provide for efficient learning? Granted, such a teacher is not usually trained to carry on formal reading instruction; but then neither are many other secondary school teachers. Granted, also, is the fact that most classroom teachers appear to consider any attempt at reading instruction an imposition on the time and effort necessary to learn the content of the subject. What responsibilities, then, can the teacher assume within the limitations of his time and training?

Suggestion 1. The teacher should consider seriously the goals of his instruction. If, for example, his goal is a relatively simple manipulation, then the procedures to this goal will probably be rather simple—perhaps even cut-and-dried. Possibilities for reading instruction would be quite meager in this case because the goals do not call for anything beyond manipulation.

If, on the other hand, the specific goal is learning a particular operation *and other ramifications involving that operation,* then the procedures to that goal will be a bit more complex. Refer to the Betterini article, which is an excellent example of ramifications relevant to a goal. The teacher could have explained all the necessary details of producing an ice bowl, but his instructional goal included having the students learn the processes involved in research and investigation. He was, in effect, teaching his students to read the necessary content.

The initial responsibility for reading, then, lies directly with the vocational teacher. He must first determine what he wants his students to learn.

Suggestion 2. Let us assume now that the teacher has determined that his instructional goal is the complex one involving not only what to do, but how to do it. Readiness now enters the picture. The teacher must determine what background experiences are necessary in order to learn the new concept. What vocabulary must be learned? What basic skills are needed in preparation for the new skill?

Sometimes this phase may only involve a review since the necessary vocabulary and basic skills might have been a part of the curriculum prior to this lesson. At other times the teacher will have to introduce the necessary vocabulary and skills and, by questioning and/or observing, determine if the students are ready for the new skill.

What can the vocational teacher do to help his students analyze and recognize the vocabulary? Formal word analysis skills probably shouldn't be attempted, yet some help can and should be given. Perhaps it would suffice simply to say "*Fuss* about the words. Do lots of things with them."

Funk (*2*), in an article in *Industrial Arts and Vocational Education,* suggested four techniques: 1) labeling, 2) identifying, 3) demonstrating, and 4) using technical illustration. He refers rather specifically to tools, but these processes should probably be followed with whatever terminologies are to be taught.

The teacher might also consider the entire sequence of language development—understanding, speaking, reading, and writing—to help guide him in vocabulary activities. In order for a student to have "learned" a term, he should be successful at all four of the sequence stages. Thus, when a student can indicate his understanding of a word by speaking it in a logical context, recognizing it in print, and then writing it in a logical context, learning has apparently occurred.

Back to *fussing.* Some words in the content areas lend themselves to interesting analysis. Just comparing the structure of a word with its function many times will aid in learning those words. Examples in vocational subjects follow:

tailstock	tail + stock
offset	off + set
setover screws	set + over
headstock	head + stock
spindle	from a spinning wheel
caliper	comes from caliber, a measure of diameter

Probably the most important aspect of readiness is to teach the students to apply readiness to themselves—to ask questions that will guide them toward appropriate and satisfactory answers. This task is best accomplished by the teacher's first asking questions relevant to the new material to be covered and then encouraging the students to develop their own questions. Think of the questions Betterini's students asked themselves.

The importance of these questions cannot be stressed too much. It is at this stage of the learning sequence that the student internalizes the need for investigation. His reason for reading then becomes real and relevant. He will read in order to resolve his readiness and satisfy his inquiry; he is not reading because a teacher told him to. Unfortunately (or perhaps fortunately) no one can tell anyone exactly how to ask those questions. If someone can understand their value, then he will be the best judge of the type and degree of question that best fits the situation.

Most textbooks in reading suggest that several comprehension skills be taught, such as, reading for the main idea, reading for important details, or increasing rate of reading. Use of such skills is often the logical result of appropriate readiness questions. If a question calls for details, then the logical answer will be those details. If the question calls for main ideas, then those main ideas will be the answers. Reading rate will be determined by the purpose.

Suggestion 3. The materials available for finding answers to questions are, of course, quite important. If a single textbook is being used, then the answers students find will be limited by a single source. It is obvious that Betterini did not limit his students to a single text.

Students should be encouraged to use as many and as varied sources as possible to investigate and research answers to questions. Using many different sources may be of great benefit in alleviating the anxiety of a student who has a serious reading problem. He has a much better chance of success when he has some choice of reading material especially if the material represents different reading levels.

Suggestion 4. When the reading has been accomplished, the students should meet with the teacher—formally or informally—to discuss or otherwise resolve the readiness questions and put the answers into some perspective. This is the time for sharing and trading ideas found by the various students in their investigations. The word *discussion* should not be considered a limitation. Other methods include student reports, committee or group reports, charts, graphs, pictures, and models.

The teacher takes this opportunity to determine whether the students are ready for the culminating experience. He can use tests or more informal evaluations based on his observation of the discussion.

Suggestion 5. The new concept or skill should then be applied to an appropriate situation—construction, manipulation, design, or whatever is the ultimate goal established in readiness by the teacher and students.

Conclusion

It is important that the teacher do everything he can to provide for the internalization of the learning process as well as the specific goal to be learned.

It is not enough to graduate a student who can make an object on a metal lathe; it is more important to teach him how to learn to make a better object or to make the object better.

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Reading and Science: Problems Peculiar to the Area

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THE SCIENTIFIC METHOD is a time-honored design for learning. Within the various science courses in our schools we attempt to guide, lead, and show the students how to apply this method to their study. In fact, we use an adaptation of it in other content areas as an approach to teaching and learning which we call problem solving. Hunt (*2*) stated in 1956, as the undersecretary of the U.S. Department of Health, Education, and Welfare, that problem solving is a characteristic feature of all life. In the lower forms of life, it is called adaptive. But with man, Hunt maintains, we have something new in problem solving. Such factors of human intelligence are used as choice deliberation, profiting from experience, and learning.

Perhaps the application of the scientific method is one of the problems peculiar to the content area of science. The student may find it easy enough to memorize and even understand the steps of the method. But can he apply it? Do he and his teacher know the reading skills related to each step?

Problem 1. Relating the Reading Skills to the Scientific Method

Before a science teacher can plan in his teaching for the fusion of reading skill instruction with scientific information, he must become cognizant of the reading skills as they pertain to printed materials in science. Shepherd (*5*) has listed the following reading skills needed by the student in the sciences:

- Skill in varying the rate of reading according to the purpose for the reading and the nature of the material.
- Skill in using parts of a book.
- Skill in locating and using sources of information.

- Ability to use correctly the vocabulary of science.
- Ability to understand and use formulas and scientific symbols.
- Ability to gain accurate information from graphic aids.
- Ability to read for exact meaning—noting main ideas and supporting details.
- Ability to organize ideas obtained from reading.
- Ability to read directions accurately.
- Ability to evaluate science materials and to draw conclusions.
- Ability to apply data from reading to practical problems.

Next, the teacher will need to analyze the steps of the scientific method to determine the appropriateness of the specific reading skills to each step. Then, the teacher will assist the students in the application of the appropriate reading skills to each step. The skill will be taught and used when its use is required by the student.

The first step of the scientific method is to define the problem to show that it has limits, is specific, and can be investigated. The basic reading skill needed here would relate directly to the vocabulary of science. An adequate background in scientific vocabulary as well as precision in the use of such terms are both requirements to be met if the student is to state his problem with accuracy and definiteness.

The next step is collecting evidence that bears upon the problem. The skills of reading that are related to this step of problem solving are a) those needed for locating information in printed sources (using various parts of a book and many different sources), and b) those needed for getting the literal understanding of the reading material (understanding scientific vocabulary, symbols, and formulas; interpreting graphic aids; reading directions accurately; noting main ideas, their supporting details, and the sequence or organization of main topics).

Setting up hypotheses is the third step. In setting up possible solutions to the problem, the pertinency and relative importance of the individual data that have been collected must be determined. Basic relationships between the data must be perceived. (Steps 3, 4, and 5 of the scientific method involve critical thinking and critical reading. They require an interpretation of the facts. The validity of the interpretation depends upon the ability to evaluate science materials and to draw conclusions.)

The fourth step is selecting the most likely hypothesis and testing it. Selecting and testing the most likely hypothesis involves substantiating all data, organizing the data into a logical sequence, and determining the adequacy of the selected hypothesis by relating it to the problem.

The fifth step, drawing conclusions, requires the student to compare the consistency of the conclusion with the data and the problem. Judging the significance of a finding and seeing the relationships of it to various phenomena point up the use of such interpretative reading skills in science.

Finally, the sixth step is applying scientific data to practical situations. Even though "applying scientific data to practical situations" is not a step of the scientific method, the ability to think of practical applications is of such importance that instruction in the skill is generally included in any problem solving unit.

The scientific method as well as the reading skills must be taught together, and they must be taught in the science classes where they are to be used. The scientific method and the skills must always be associated in the students' minds with some subject matter. The subject matter becomes the agent for practice in the tools of inquiry and information acquisition.

Problem 2. The Difficulty of the Reading Materials in Science

Writing in science is characterized by factual content packed to high density which requires slow reading and intense attention. Many students are not acquainted with the demands of such materials. Bamman (*1*) points out that students have learned through extensive practice in basal readers which contain almost exclusively narrative material. He states that the expository writing of most science books is most frequently characterized by terseness.

Mallinson (*3*), has reviewed a number of studies about the problem of reading science materials. The basic aims of the studies, he says, are 1) the development of science vocabularies suitable for the topics being studied and 2) the sequential growth of reading skills for better understanding of science. These aims are admirable. Indeed, if they could be implemented, the science student would receive a sizable boost toward an easier and greater facility in reading. However, Mallinson further asserts that the implementation of these aims is hampered by four major difficulties. One is the effect in the sciences of its recent and sudden growth which has resulted in speeding up changes in vocabulary. Some words become obsolete, and new ones are added. Another difficulty is the lack of continuity from one grade level to another. There seems to be little overall unity which in turn affects the unified integration of the reading skills with the science material. There seems to be a definite lack of sequence. A third difficulty is the sophistication of scientific materials with which students have increasing daily contact. This condition may bring about a pseudosophistication in the student because of interests in increasingly complex ideas. And, as Mallinson states so well, "It is indeed difficult to utilize a 'one syllable word' vocabulary for developing a 'ten syllable' science concept." Finally, the fourth difficulty is the continuing disagreement among authors and publishers concerning the level of reading difficulty on which the books should be written.

Obviously, the student needs guidance in reading scientific materials. We have noted that he has not received much instruction in reading such expository material. And though science textbooks are improving, there are difficulties which still need to be surmounted. Smith (*6*) suggests that the science teacher will need to help the student recognize various patterns of writing in the science materials. One such pattern is the set of directions for carrying out an experiment. Obviously this writing requires meticulous reading for exactness. The student will also need instruction in the steps to follow when reading directions. A second pattern is classification in which information is sorted under common headings and subdivisions. The skills of noting the main idea and relating the pertinent details to it are of prime importance with this type of writing. A third pattern noted by Smith is the explanation of a technical process with the usual accompanying diagrams. The ability to follow the sequence of an explanation, obtain information from diagrams, fuse the information from the diagram and the written material, and note the precise use of pertinent vocabulary are needed for this pattern. A fourth pattern is the detailed statement-of-facts pattern. This pattern requires a firm grasp of the vocabulary as well as a clear understanding of main ideas and the details pertaining to each. Much discussion and practice in class are needed to develop this skill.

There seem to be two inferences which should be drawn from Problem 2. First, the student must receive guidance in *how* to read his science textbook as he is using it in his science class. The second inference is that the teaching of scientific content and the reading skills needed by the student for the acquisition of such content are fused. They are not taught separately. Further, they are intimately related, one supporting and developing the other.

Problem 3. The Vocabulary Load in Science

Science is regarded as a technical subject. There are many concepts to be learned and they must be expressed by using words which are pertinent. These words are often new to the student and have little relationship to his past experience. Marksheffel (*4*:182) points out that the vocabulary of science is exact and precise. There is no room for loose generalizations or hazy ideas about the meanings of the words. The exact nature of the subject requires precision in word usage. For instance, accuracy of expression will likely require the student to be able to use such terms as *round, spherical,* and *globular* in appropriate contexts. Vocabulary precision in science cannot allow fuzziness to the extent that these three words would be considered synonymous.

The vocabulary of science can be classified into two categories. One category includes words known by the students in a general context but also having a specific scientific meaning. For instance, most of the students would know how to read (decode) the word *fire* and would know also what *fire* is in general terms. Many would have had specific experience with it, either of a positive or a negative nature. But how many would know the scientific meaning of the word? How many would be able to explain the chemical changes which take place as material is burned? Would they know whether fire consumes or rearranges and reconstitutes matter? The student may not know the scientific phenomenon taking place in a fire. However, he is glib enough with his speech to decode the word and relate experiences regarding it.

The other category is composed of the technical words. These are words which are solely applicable to the science field, some to a specific subject within the whole science spectrum. *Photosynthesis, osmosis, hydrolysis,* and *chromosome* are examples.

New words in science should be related to the students' backgrounds of past experiences. The scientific terms need to be explained to the students in ways which will enable them to tie it to former knowledge. The unknown must be tied to the known.

Unless we can help the student in his mastery of the vocabulary so that it can be and is incorporated into his language pattern, we may find the conscientious student resorting to rote memorization. Marksheffel (*4*:185) cites possible reasons for such memorization.

> There are various hypotheses about why some students resort to memorization as a form of learning. It is possible that students, lacking the mental and emotional maturity for understanding the material at the time it is presented, memorize formulas, definitions of key words, and textbook phrases with the hope of passing a test. Other students may be mentally lazy and find that it is simpler to memorize than to work for meaning. And in certain instances teachers may unwittingly contribute to student memorization by insisting that students use the author's exact words when answering questions. Whatever the factors are that contribute to student memorization of material, teachers must be on the alert for signs that indicate students are substituting memorization for understanding.

Concepts and vocabulary are closely related. Some concepts are more basic than others. Some vocabulary is more inclusive than others. Teachers will find it worthwhile to list the words given in a textbook in an outline. Such an outline will show the basic organization of the concepts pertinent to a topic of the subject matter. For instance, note this outline from a list of words given at the end of a unit:

- Biosphere
  - Ecology

Food chain—
  - omnivore
  - carnivore
  - herbivore
  - parasite
  - predator
  - producer

Photosynthesis
  - chlorophyll
  - respiration

If such an outline of words is analyzed, the basic organization of the subject matter will become apparent. This technique can be very helpful to students as they attempt to master their vocabulary and as they try to sort out the interrelationships of the ideas.

A Plan of Study

The problems of reading in science are not insurmountable. The interest of the science teacher in developing in his students techniques of learning the skills of meticulous science reading is a prerequisite to an effective procedure. Coupled with this interest, of course, is the teacher's knowledge of the science reading skills, how they can be taught, and—most important—how the skills and the subject matter are fused.

Perhaps the teacher's philosophy is basic to his involvement in the techniques of subject matter acquisition through reading. Time and effort will be required. To fuse subject matter with skills, the teacher must plan and become as acquainted with the reading skills as he is with the content of his special area.

Given, then, the philosophy to embark upon a science-reading program in a science course, a program which will be the underpinning of interest and planning, the next step is to evolve and implement the fusion between reading and subject matter. An outline of a subject matter unit follows which shows both how subject matter is covered and how reading skills are developed. This seventh grade unit shows the type of planning, content organization, and procedure a teacher (or curriculum committee) can evolve.

UNIT ON ENERGY IN THE ENVIRONMENT—SOUND, LIGHT, HEAT

Purpose of unit

Some kinds of energy are used to make everyday living more comfortable or more convenient. An attempt has been made to explore sound, light, and heat as sources of energy. After studying this unit, students should understand how different kinds of energy may be used.

Unit divided into six problem areas

1. How is sound used? Where do sounds come from?
2. How do vibrations become sound?
3. What is light? How is it used?
4. What are the characteristics of light?
5. How is heat used in daily living?
6. How does heat travel and what does this mean to those who build refrigerators, homes, and schools?

Basic understandings to be developed in the unit

All sounds begin with a vibrating body.
Sound will travel through any substance that can vibrate.
Sound waves travel in all directions from a vibrating body.
Sounds differ in loudness, pitch, and quality.
Energy is necessary for living.
Heat is a special kind of mechanical energy.
Energy comes from the sun.
Heat travels through air, water, and metals.
Both light and sound travel in waves but are different in kinds and in ways of traveling.
Light waves are transverse.
Light can travel through a vacuum.
Light waves can be directed.

Lesson 1, Problem. How is sound used? Where do sounds come from?

(This lesson may take several days or class periods. Lesson and class period are not synonymous.)

Aims: To help students understand that they live in a world of sound.
To study the various methods of communication through sound.

Method: Discussion and demonstration
(Follows, basically, the five steps of a typical directed reading activity)

- I. Preparation for reading
  - A. Readiness:
    - 1. Display objects and/or pictures of objects which produce sound.
    - 2. Identify and then list different sounds made by animals and objects.
    - 3. Use students' questions and comments as a source of the concepts which they already have and those which need to be developed.
      - a. What is a sound?
      - b. What are the characteristics of sound?
      - c. Where does sound come from?
  - B. Concepts to develop:
    - 1. Sound differs in three ways—loudness, pitch, and quality.
    - 2. Sound originates with a vibrating body.
    - 3. Sound will travel through any substance that can vibrate.
    - 4. An echo is a sound reflection.
    - 5. Sound is controlled in many ways.
    - 6. Noise is sound that has no value.
  - C. Vocabulary: characteristics, sound, pitch, loudness, quality, vibrate, vibration, reflect, reflection, insulation, acoustics.

    (Approximately three of these words will be introduced during any one class period.)
  - D. With students' help, establish purposes for reading. (Write those purposes on the board.)
    - 1. How are sounds made?
    - 2. Why do sounds differ in loudness?
    - 3. How are sounds reflected?
    - 4. How are sounds controlled?
- II. Silent reading to find answers to specific questions.
- III. Oral discussion of purpose questions, further explanation of subject matter, and development of related reading skills.
- IV. Rereading (silent or oral), if essential, to answer an individual need or specific class needs, or to present still further information, and/or to present further instruction in the reading skills.

V. Follow-up

A. Demonstration (may be included as well as in steps three and four).

1. Problem: To prove that sounds can be reflected.

2. Materials: One large empty room.

3. Procedure:

a. Take the students, a few at a time, into a large, bare, vacant room.

b. Have them speak from the stage in the empty auditorium.

c. Have them speak in their classroom with fellow students.

4. Observation: Compare the results of the sound made when speaking from the stage in an empty auditorium with that made when speaking in a room that is filled with people. Explain.

B. Related activities:

1. Have students list ways in which people react to sounds.

2. Have students explore their building to find things which help stop the reflection of sounds.

In such a plan as this, solutions to the problems of science reading are offered. Provision is made for skill incorporation into the methods of science study. The problem solving approach is used with instruction given specifically to help the students acquire the needed subject matter. Instruction is provided in the techniques of reading the science textbook effectively. The basic steps of a directed reading activity are used. And, finally, vocabulary development is fostered. New words are introduced before the student reads from his textbook. In the subsequent discussions, further clarification is evolved as the students sharpen their thinking in the attempt to communicate the concepts to their peers. Opportunities are also given for the application of the words.

Concluding Statement

The problems of reading in the sciences require student-teacher teamwork in ascertaining the problems and then in developing procedures to contribute toward the solution of the problems. The problem of incorporating the reading skills into scientific methodology should be planned by the teacher and then with the students. Students can work toward the solving of many of their own problems if they are informed. Similarly, student understanding of textbook aids and vocabulary study will abet their ability to use the reading materials of science. The scientific method is as applicable to student development in the skill of reading science materials as in learning scientific understandings.

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Reading and Mathematics: Research in the Classroom[*]

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SINCE THE FALL OF 1968, Syracuse University has cooperated in the establishment and maintenance of two research and demonstration centers for secondary reading instruction. The centers, supported by the U.S. Office of Education, are located in the Jamesville-Dewitt School District (J-D) and Tully Central School (Tully). The major objectives of the centers are to train secondary school reading consultants and to design and conduct research in reading in the content area classroom.

Our work is proceeding under the following basic assumptions: First, it is our belief that reading at the secondary level is primarily concerned with comprehension. The problems of decoding, while very real and extremely important at the primary level, are but a relatively short and narrow phase of the normal child's reading development. Therefore, we hold that reading comprehension is our main concern.

Second, we believe that it is difficult or impossible to distinguish among the terms *reading comprehension, content learning,* and *concept development.* The similarity suggests that the reading specialist is in reality a teaching-learning specialist. Further, it suggests that the reading consultant and the content teacher have a common purpose: to encourage and guide students in acquiring, interpreting, and applying substantive ideas.

Our final assumption seems to follow from the first two: It is our belief that reading-thinking skills can best be taught in the context which determines them. In other words, reading instruction at the secondary level is most effectively accomplished in the subject matter classroom.

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This discussion, however, will concern itself with the second major objective, that is, the design and execution of research in reading in the content area classroom. More specifically, it will describe one sequence of research in mathematics classrooms.

Research Approach

Our approach to classroom research has been influenced rather strongly by commentators such as Krathwohl (*1*) and Levin (*9*). We have attempted to combine the relevance of action research with the rigor of the more traditional comparative techniques. A brief description follows.

Initially, we select a recommended classroom practice and persuade a classroom teacher to adopt it as part of his own methodology. Over a period of time we evaluate the effects of the practice on the attitude and the achievement of the students. We solicit both the teacher's observations and introspective reports from the students. On the basis of tentative conclusions, we "tinker" with the methodology—rejecting, revising, rethinking. As our method becomes more clearly defined, our tinkering gives way to ministudies. These relatively short-term, small sample experiments are a bit more rigorous and rely more heavily on objective data and statistical analysis. A series of ministudies produces information which reliably narrows the focus and defines the method under study. At this point, a rigorously controlled experiment is planned to compare the method so developed with a different approach.

The research procedure just described is illustrated throughout the remainder of this paper. We believe that it may be effective in developing classroom practices which are practically, psychologically, and pedagogically sound and which avoid hasty comparisons of poorly defined methods.

Tinkering

At the outset, various individuals involved at the centers became interested in exploring some rather widely accepted practices.

Readiness activities are often recommended (*10, 12*). Technical vocabulary is a problem of special concern (*3, 11*). Content objectives should be clearly formulated (*6*).

The incorporation of these classroom practices by some of the teachers was accomplished. The results seemed promising. However, there was often an uneven quality about these practices that was troubling. Something seemed to be lacking.

Then someone discovered "advance organizers." Ausubel's (*2*) description of information presented to students before reading seemed appropriate to subject matter learning by any media. The concept suggested a means of weaving together the practices of readiness activities, vocabulary instruction, and the provision of content objectives. Unfortunately, we found Ausubel's ideas difficult to understand and all but impossible to implement in the classroom.

Barron (*4*) proposed the use of what he called a structured overview, using key vocabulary arranged to show relationships among the terms and the relationships of the vocabulary to the structure of the discipline. Barron (*4*:5) suggested that the structured overview ". . . assumes the properties of Ausubel's advance organizers." An analytical look at the structured overview revealed some interesting potential:

- It is relatively easy for teachers to understand and construct.
- It provides a review of material already covered.
- It provides a preview of material to be covered.
- It helps the student develop an appropriate mental set.
- It familiarizes the student with the teacher's content objectives.
- It promotes student awareness of the structure of the discipline.
- It provides the student with a framework within which to fit more detailed information; i.e., it gives him a set of labeled "hooks" on which to hang his ideas.

Space does not permit a detailed description of the weeks of subjective evaluation and revision that characterized the initial development of the structured overview. We tried it out in an English class, two mathematics classes, and four biology classes. However, it was developed and modified sufficiently so that we felt the need for more objectivity.

The remainder of this paper is devoted to two ministudies which represent continuous progress toward a clearer definition of the structured overview.

Samples

We selected two mathematics classes from each of our two centers. From J-D, which serves a suburban middle-middle to upper-middle socioeconomic class, we selected two ninth grade classes. These classes were judged by the administration to be above average in terms of achievement. On the basis of their performance in mathematics throughout the year (the ministudies took place in March and April), the teacher judged them to be comparable.

From Tully, which serves a rural lower-middle to middle-middle socioeconomic class, we selected two seventh grade classes. These classes were judged by the administration to be average in terms of achievement. On the basis of their performance throughout the year, the teacher judged them to be comparable.

Procedure and Treatment

In addition to the judged comparability of each of the two pairs of classes, we asked each teacher to construct a content pretest and administer it before beginning the treatment. We asked that this test be a representative sampling of the desired terminal behaviors. Copies of the content test are in Appendix C. One class in each school was randomly designated as the experimental group. The differences in each school between the experimental and the control groups on the pretest are shown in Table 1.

TABLE 1

CONTENT TEST (PRE)

	Mean (Exp)	*Mean (Con)*	*df*	*t*	
J-D (9th)	1.27	1.20	40	0.192	NS
Tully (7th)	4.00	3.73	59	0.394	NS

Before the treatment began, we met with each teacher for three 45-minute planning periods. The treatment lasted sixteen days at J-D and thirteen days at Tully. While the experiment was in progress, we met for one 45-minute planning period with each teacher. At no time did we visit either the experimental or the control classes since we felt that our presence might bias the results.

The experimental treatment itself consisted of three parts: First, we asked each teacher to construct a structured overview of her unit. The actual instructions to the teacher are as follows:

1. Select every word you intend to use in this unit which you think is necessary to the students' understanding of what you want them to understand.
2. Take the list of words (you may have 12 and you may have 50) and arrange them and rearrange them until you have a diagram which shows the relationships which exist among the ideas in the unit, as well as their relationship to the semester's work and mathematics itself.
3. On the first day of the unit, write the diagram that you've made on the chalkboard. While you're doing this, explain why you arranged the words as you did and get the students to contribute as much information as they can.
4. Throughout the unit, as it seems appropriate and comfortable, refer to the structured overview. Sketch portions of it on the chalkboard if you wish. The object here is to aid the student in his attempts to organize the information in a meaningful way.

The structured overviews thus produced are also included in Appendix C.

Second, we asked each teacher to preteach one or two words each day which she judged to be important to *that day's* lesson. The preteaching was done eight out of sixteen days at J-D and eight out of thirteen days at Tully. We asked the teachers to preteach words in terms of 1) the context in which it operates within the discipline or 2) familiar meaningful parts of the word, for example, *poly* and *nominal.*

Third, we asked each teacher to allow students to reflect on major sources of confusion in their homework assignments by arranging themselves in small groups of two to five. This work was done eight out of sixteen days at J-D and seven out of thirteen days at Tully.

Both teachers agreed that the major difference between their experimental and control groups was the structured overview. In the control classes, the teachers gave a brief introduction to the unit which consisted largely of the work to be covered and the length of time they would spend on the unit. The teachers had been in the habit of explaining key words. They believed the only difference between experimental and control classes with regard to this aspect of the treatment was the timing; that is, the words were pretaught in the experimental groups while in the control group the words were taught as they came up during the lesson. The grouping activity was not new to either group although it was accomplished more formally and more frequently during the study of the experimental groups.

Findings

On the last day of the treatment, a content post-test was administered to the four classes. In each case this test was identical with the pretest, except that the items appeared in a different order. The differences in each school between the experimental and the control groups on the post-test are shown in Table 2.

TABLE 2

CONTENT TEST (POST)

	Mean (Exp)	*Mean (Con)*	*df*	*t*	
J-D (9th)	11.86	11.95	40	0.119	NS
Tully (7th)	14.03	14.00	55	0.035	NS

The teacher's reactions to the use of the structured overview were quite positive. One of the teachers made the following statement: "Preparing and using the overview made my teaching easier. I knew exactly where I was going. I just can't believe that there are no significant differences. I *know* the experimental group understands the unit better." This sort of frank post hoc analysis led us to the construction of a test of meaning relationships. We worked with the teachers in constructing this relationships test. We drew the multiple-choice items from two sources: 1) understandings integral to the operations tested on the content test, and 2) relationships suggested by the teacher's construction of the structured overview. Copies of the relationships test are included in Appendix C. The test of relationships was administered three weeks after the last day of instruction for the groups at J-D and two weeks after the conclusion of the experiment at Tully. The differences in each school between the experimental and the control groups on the relationships are shown in Table 3.

TABLE 3

RELATIONSHIPS TEST

	Mean (Exp)	*Mean (Con)*	*df*	*t*	
J-D (9th)	12.32	10.78	43	2.026	$(p < .025)$
Tully (7th)	5.97	3.24	56	6.878	$(p < .001)$

In order to test the retention effects of the treatments, we scrambled the items of the content test again and administered them to the groups. This test was given four weeks after the end of the experiment at J-D and three weeks after the end of the experiment at Tully. The differences in each school between the experimental and control groups on the delayed test are shown in Table 4.

TABLE 4

CONTENT TEST (DELAYED)

	Mean (Exp)	*Mean (Con)*	*df*	*t*	
J-D (9th)	10.29	10.91	41	0.668	NS
Tully (7th)	13.41	10.10	56	3.170	$(p < .005)$

Limitations

1. The implications of our investigations thus far are limited by the extent to which the relationships shown by the structured overview are important to the learning of mathematics.

2. Another limitation is the fact that the structured overview was only a part of the experimental treatment. The overview could have interacted with the vocabulary preteaching and/or the small group discussion.

3. To this point, the investigation is limited by the reliability and validity of the measurement instruments used. The relationships test, for example, was a post hoc effort. In addition it was constructed using the structured overview as well as the content test as guides.

Conclusions and Implications

1. Both experimental and control classes learned the computation equally well in terms of immediate recall. The experimental group at Tully appears to have retained the ability to compute somewhat better.

2. The experimental group in each school learned *more* of the relationships that exist among the vocabulary terms than did its control. In the case of the Tully control, it is not clear whether the control group learned *any* of the relationships since the expected chance mean is 2.00 and the obtained mean is 3.24. The J-D control group appears to have learned some of the relationships since their expected chance mean is 4.8 and their obtained mean is 10.78.

3. Students tend to learn what they are exposed to and tend not to learn what they are not exposed to. It is interesting to note that both teachers made up a content test which they later agreed was almost solely a test of computation. Therefore, it was not a representative sampling of the desired terminal behaviors since the teachers had constructed the structured overview to correspond to their content objectives. One might conclude that the teachers did not test what they said they wanted to teach. Further, with regard to the control classes the teachers apparently did not teach what they intended to.

4. The structured overview, as described herein, may be a constructive and efficient way to provide readiness, vocabulary instruction, and goal clarification, all of which appear to be facilitative of success in learning mathematics. One might hypothesize that the overview provides an integrated sort of readiness which extends into and throughout the content lesson.

In Conclusion

Additional ministudies are planned to rectify the limitations identified thus far and further clarify the concept of a structured overview. Eventually, it will be subjected to rigorous comparative experimentation.

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The Conditions for Critical Reading

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TYPICALLY, critical reading skills are taught (as is almost everything else) in a sequential and linear fashion which I believe is not only irrelevant but superficial. There is a tendency to either ignore true critical reading or to offer it in the form of prescribed skills at prescribed times; and generally it is taught, as are most other reading skills, in isolation and out of context.

We can all list many of the critical reading skills, and almost everyone can teach some of them to classes of students; so it is not my intent to review the names and groupings of skills classified as critical reading. Too much time has been spent, much of it wasted, in carefully listing and grouping skills rather than in establishing the conditions which will make the learning and application of these skills a relevant and live activity and experience for the readers.

Too often critical reading is presented as a series of skills, which are often only polished comprehension skills to get at basic information and a superficial glimpse at the meaning. Real meaning exists, not in the words in print but in the spaces between the words and in those unique spaces between a reader as a whole person and the writer as a whole person in a world in which many things occur simultaneously, not in a sequential or linear fashion.

Critical reading is an organic whole of values, beliefs, information, feelings, conditions—in short, critical reading, at any level, requires the total participation of a whole person in a total environment. Learning the propaganda techniques (one or all of them) is not all there is to critical reading, obviously. Nor would I call it critical reading if a student knew and could apply in specific situations all of the skills one might list. The whole is greater than the sum of its parts in the area of critical reading.

The way a classroom is physically set up, the smell of the room, lighting, the psychic dimension, and interrelationships between the students and between the students and teacher are significant ingredients. A classroom which stimulates critical reading and all interpretive reading goes far beyond selected materials and specific lessons. A classroom which stimulates critical reading is alive with questions, with energy and vitality, and with feeling, as well as with information. Very little critical reading is taught because these conditions rarely exist; classrooms are ordered by prescription from someone else; the subject matter is controlled and carefully doled out, on schedule. The key to most classrooms appears to be control and order—the need, on the part of the teacher, to "cover" material or skills. Critical reading cannot be fertilized in such an arid climate.

Critical reading is the way we use words as windows through which students (and teachers) begin to see into life and experience. Critical reading is considered a verbal task. And yet, critical reading should be a blend of the nonverbal and the verbal, for it should be the total immersion of the reader in what is being read. This is the way words become windows through which the critical reader begins to see into the author and his world, beyond his words; this is the way the reader begins to see into himself and his realm of life experience.

Critical reading is a way of looking at the world and its many interwoven relationships of persons, places, things, and feelings. The critical reading facility, since it is much more than mere skills applied to particular matter, must be supported by foundations laid in every year from the first year of school onward. Of course, the quality of the interpretation will improve during the years, but what has to happen in the early grades if we are to get really perceptive critical readers in high school is the development through involvement of youngsters in experiences which will call on them to use all of their human skills and sensitivity. The essence of critical reading is seeing relationships, sensing moods and tone, and being able to bring to bear on all reading situations, verbal and nonverbal, a total awareness of what is occurring.

Critical reading, then, is not merely a set of skills offered in some predetermined order, nor is it restricted to junior and senior high levels. Most university students who have trouble staying in school, irrespective of their major field, lack critical reading skills.

They have learned too well, starting in grade one, that one focuses on specific skills, specific formation, and facts and that one never gets to the overall, the gestalt, view of what an author is saying. Poetry is a joy for those who can share, through the poet's words and images, or who can re-create in themselves the sensory realm and the intellectual realm of the author. If one reads poetry or any great literature as an exercise in vocabulary and definition, one has missed the whole point. Such persons, and there appear to be many, do not like to read much; and when they do read, they are most likely to be literal in their understanding of what has been said and why it has been said. It's like believing you are living in the reflection of a TV set or believing you are living a human experience by saying words quietly to yourself as you look at a book.

We can create conditions for this kind of total immersion, which I call critical reading, if we think about the way almost all of us learned the most important things in our lives: how to speak our native tongue; how to feel and express love; how to survive in a threatening and ambiguous world. All of these universal human learnings did not come through a set of prescribed skills, lesson plans, or homework assignments; they came through life experience, past words, and joy. Mother does not (usually) plan lessons for her two-year-old toddler by spelling out the elements which will be taught during a given week. She talks to her child; she responds warmly with joy and real interest; when she is pleased, she expresses it verbally, nonverbally, and sincerely. The child likes language; he likes communicating; he is curious and interested. He develops concepts, rules, judgments on his own with little formal instruction and grading. Yet when he gets to school, especially when we teach him to read and write, all of that gives way to rigid work assignments and the fragmentation of the entire world of information and experience and feeling.

Clearly a critical reader, of any age or grade level, must be helped to develop an integration of knowledge, sensitivity, and thinking ability. I do not mean thinking in the usual sense of understanding a series of facts or other information and merely drawing some conclusion from them; I mean the type of thinking which utilizes specific information in several areas and subjects and which naturally integrates this information with a blended awareness of life experience and feeling. In this kind of thinking there is no separation between thought and feeling and a very pervasive sensitivity to words, people, events—to the total world in which he finds himself. Classrooms can become such incubators for critical reading only if the teacher is so sensitized and willing to let learning and thinking occur in global, nonsequential, and nonlinear ways.

Let me present one illustration which bears on this last point and is directly related to some means of stimulating and encouraging critical reading. Many teachers have denigrated the use by students of colloquial language or street talk. They have criticized such language usage as inappropriate. Yet, if they would investigate these expressions, they would find the most sensitive use of language—metaphor. Everything students bring into class is not necessarily a great poetic or literary contribution, but many disadvantaged adolescents are verbal in ways different from the typical middle-class child.

Look at a common metaphor of the type just mentioned, "pressed vines." Vines means good clothing, and pressed means special or best; hence, pressed vines means the very best clothing you have. Let's study the metaphor: vines grow very closely on buildings or fences; clothes which fit as vines do would be a perfect fit; vines are a bit shiny, and if they were pressed (which slightly mixes the basic image), they would be "the most." Why not use this type of metaphor as a beginning step in teaching poetry?

Such imagery can lead to others and can develop greater sensitivity to seeking new relationships among objects, textures, and people. All of this matter is part of the process of critical reading and thinking. Add to such sensitivity and awareness some of the usual skills, in new contexts, and critical reading becomes a way of life—a perspective.

Critical Reading Applied

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THE READING MATERIALS utilized by the student in secondary school require functional control of a repertory of critical reading skills. On these rungs of the educational ladder most citizens receive their last supervised critical reading instruction, and it is not an overstatement to say that the survival of a democratic society is vitally linked to a people capable of making wise choices through critical analysis. The student who wishes to succeed in the upper levels of education must possess a veritable constellation of verbal decoding and interpretation processes through which he may engage in a virtual dialogue with an author. In secondary school, therefore, the student is called upon to apply a series of interlocking linguistic and thinking skills in order to elicit the maximum meaning from what is read.

Guidelines are presented in this paper for the teacher of reading to assist the student in secondary school in the development of functional critical reading skills. In this regard a) critical reading will be defined; b) the essential critical reading skills needed in secondary school will be reviewed; c) the prerequisite skills for critical reading will be discussed; d) the role of experience in effective critical reading will be assessed; and e) an instructional unit encompassing an indispensable critical reading skill and its application will be outlined.

The Nature of Critical Reading

A comprehensive analysis of the dimensions of critical reading has been made by Wolf, King, and Huck (*11*). In this source the authors present a wide range of definitions of critical reading which reflect narrow views as well as comprehensive ones.

For example, Triggs (*10*), Gans (*2*), and others are reported as advocators of limited definitions of critical reading in which the total act centers upon a few specific reading abilities. On the other hand, Smith (*9*), Robinson (*6*), Russell (*7*) and others are represented as having views of critical reading which encompass numerous reading-thinking abilities in which the reader goes far beyond the literal level of comprehension.

An examination of the literature will reveal that Smith, Robinson, and Russell all place critical reading at the highest level in a hierarchy of reading comprehension skills. The hierarchy includes an inextricably involved continuum of psycho-sociolinguistic skills which range from a) literal comprehension—understanding the denotation of words, ideas, or sentences in context; b) interpretive or inferential comprehension—obtaining deeper meanings not directly stated in the text; to c) critical reading—evaluating the quality, the value, the accuracy, and the truthfulness of what is read. Smith, Robinson, and Russell may be interpreted further as endorsing the view of critical reading as a subset of comprehension skills in the total framework of reading skills and abilities.

Writers in this field frequently relate critical reading to critical thinking. Russell (*7*), Lee (*4*), Ennis (*1*), and others maintain that critical reading is the application of critical thinking to the reading process. Russell (7) defines critical thinking as a three-factor ability which includes a) an attitude factor of questioning and suspended judgment, b) a conative or functional factor which involves use of methods of logical inquiry and problem solving, and c) a judgment factor of evaluating in terms of some norm or standard or consensus. Ennis (*1*) finds close similarity between critical reading and critical thinking skills and stresses the primacy of logical reasoning in critical thinking. He proposes that when a reader can ascertain whether a conclusion necessarily follows from given information, and if a statement made by an alleged authority is valid, that the reader is demonstrating some facets of critical thinking. In fact, from the writings of Russell and Ennis it is clear that they view critical reading and thinking as being as complexly interrelated as are critical reading and the total continuum of reading skills.

Critical Reading Skills in Secondary School

In secondary school more than on the preceding rungs of the educational ladder, Robinson (*6*) proposes that the student must be equipped ". . . to judge the veracity, validity, or worth of what is read, based on sound criteria or standards developed through previous experiences." To develop critical readers on upper educational ladders, it is essential that skills and abilities in reading for complete understanding be combined with ". . . an inquiring attitude; a background to supply knowledge about the topic, field, or area to provide standards or criteria for evaluation; the ability to suspend judgment until the writer's message is fully secured; the ability to follow the organization or logic of the presentation, recognizing what is included and what is omitted; awareness of the author's qualifications and intent; and recognition of the publisher's commitments."

From within the framework of the general aims of critical reading as viewed by Robinson in the foregoing, as well as from her conceptions of background readiness necessary for success at this reading level, specific critical reading skills which should be attained and utilized in secondary school are listed. These skills may be found in any standard source on this topic, and, while not exhaustive, this listing includes the essential ones: recognizing and discriminating between judgments, facts, opinions, inferences; comprehending implied ideas; interpreting figurative language and other nonliteral language—slang, cant, simile, metaphor, colloquialisms; detecting propaganda; forming and reacting to sensory images; anticipating outcomes; generalizing within the limits of justifiable evidence; making logical judgments and drawing conclusions; comparing and contrasting ideas; perceiving relationships—of time, space, sequence, cause-effect; identifying the author's bias or point of view; and recognizing and reacting to exceptional diction—satire, irony, cynicism.

It is to be understood that the skills just listed are the logical extension of literal comprehension skills, the mastery of which should and, indeed, must precede critical reading. In this regard, it is expected that the student has prior mastery of such skills as finding the main idea, outlining, summarizing, and the ability to understand standard syntactical forms. In the succeeding section of this paper, the subservient relationship of word attack and organizational reading skills to critical reading are explicated further.

Prerequisite Skills for Critical Reading

Critical reading in secondary school is contingent upon mobilization of the substrata factors of word attack and comprehension skills which should have been mastered by the student on the preceding levels of education. Jack Holmes' classic definition (*3*) of the total act of reading, which focuses upon its spiral interrelationships, illustrates the interdependence of the various facets of the reading process: "Reading is an audiovisual, verbal-processing skill of symbolic reasoning, sustained by the interfacilitations of an intricate hierarchy of substrata factors that have been mobilized as a psychological working-system and pressed into service in accordance with the purposes of the reader."

Despite differences today between theorists on the nature of the psychological phenomena involved in reading, there is relative consensus that the act of reading begins with word perception and recognition and that initial success in these skills precedes any possible attainment of even rudimentary literal comprehension. Successful literal comprehension, predicated upon adequacy in word recognition, in turn, is prerequisite to inferential comprehension. The latter is the precursor of critical reading.

Experience and Critical Reading

Of equal importance to the student's success in critical reading as his mastery of prerequisite reading skills is the necessity for depth and breadth of environmental experiences. It is from wide and varied experiences that language meanings derive. It is from the student's fund of language meanings that he comprehends. Paucity of experiences results in shallowness in conceptualizing and generalizing. This condition in turn limits and impedes both accuracy and flexibility in reading comprehension.

The possession of a repertory of language meanings derived from real and vicarious experiences—whether of recent or past acquisition—provides the student a constellation of ideas from which he may combine and reorganize related conceptions in ever-evolving configurations. Through increasingly skillful fusions of language meanings, the reader develops closer and closer approximations of the author's intent.

In secondary school the cumulative effect of narrow cultural exposure and participation becomes crucial. Since reading comprehension and interpretation of necessity are monitored by the reader's experiential background, every effort must be made to incorporate compensatory experiences where needed in secondary school reading programs.

Textbook Reading

One of the most universally needed critical reading skills of those listed earlier is the ability to read between the lines and to read beyond the lines, i.e., skill in comprehending and interpreting nonliteral language.

The content and format of textbooks and related reading materials on upper educational levels require maturity in the higher literacy skills. Figurative language and complex syntactical forms abound in books used in secondary school, and the student is compelled to bring to bear a synthesis of linguistic and conceptual factors in order to get the sense of what is read. The teaching of nonliteral comprehension skills is compounded further by the needs of large numbers of students who have conceptual deficits due to limited and limiting experiences. These students find it difficult to comprehend analogous comparisons which are based upon a framework of reference which they do not possess.

Newton (*5*) has analyzed the reading skills required for minimal success in coping with a typical secondary school (or college) social science textbook. She found that the following significant reading abilities are needed: a) flexible control of a basal vocabulary of 15,000 to 20,000 words; b) mature understanding of standard American English syntax; c) a sense of the essential rhetorical structures; d) knowledge of graphic and typographical forms (graphs, diagrams, italics) and skill in using the organizational structure of a text (subtitles, footnotes); e) sophisticated word analysis skills in order to attack nomenclature; and f) a repertory of reading rates.

In addition to the foregoing, Newton stresses the central importance of the student's having facility in the interpretation of figurative and nonliteral language. Since there is abundant use of metaphors, similes, and the like, as well as aphorisms and maxims in conventional texts (in the interest of vividness and clarity), Newton proposes that the real acid test of maturity in secondary and college reading centers upon adequate control of these literary stylistics.

How then may students in secondary school be prepared to meet the challenges of texts which demand a constellation of reading proficiencies? In the final section of this paper an instructional unit is presented which suggests some major concepts and approaches for guiding the student's development and functional use of an important critical reading skill—comprehending figurative and other nonliteral language.

Developing Skills in Comprehending Nonliteral Language

An instructional unit in nonliteral language in secondary school may include the following major topics: a) major figures of speech (simile, metaphor, hyperbole, litotes, metonymy, and personification); b) old sayings (the adage, maxim, bromide, aphorism, and proverb); and c) forms of nonstandard usage (slang, cant, idiomatic phrases, dialect, and other restricted usage.) Inasmuch as figurative language is utilized more frequently in standard exposition than other types of nonliteral language, in the interest of brevity, only a subunit on figures of speech is presented. It is the position of this paper that if the student firmly grasps the intent and function of figures of speech, possibly he will be equipped to generalize this understanding of inferential comparisons to other nonliteral writing.

The principal understandings which could be developed in a unit on figures of speech follow:

A. Figures of speech enable the writer to convey to the reader in a concise form that which would involve extended exposition or narration.

B. By using words in a figurative sense rather than a literal one, the writer augments the force and suggestiveness of his discourse.

C. Figurative language makes communication vivid, colorful, evocative, yet lucid.

D. Figures of speech may function as vehicles of comparison, intensification, or symbolization.

E. American English rhetoric abounds in figurative language in informal and formal usage.

F. The vocabulary of American English is the largest of any language extant, and many of its morphemes possess infinite peripheral and connotative meanings, thus permitting illimitable analogous comparisons.

G. Since word order (syntactic relations) and not word form (morphologic variations) provides the key to its meaning, American English rhetoric has endless variation.

H. The narrative and expository writing of the humanities and social sciences contain figurative language to a greater extent than does the writing of the natural sciences.

Summaries of the characteristics of the major figures of speech that follow present the essential understandings about them which may be studied in this unit:

A. The simile, when used without triteness, compares effectively two images which are essentially different but which are alike in at least one respect.

B. The metaphor directly implies comparison. It is possible, therefore, to interpret through transfer the characteristics of the subject from the attributes of the referent.

C. Through the device of personification, human attributes are given to inanimate objects and abstract concepts. This design can assist the reader in making very abstract ideas concrete.

D. Hyperbole is utilized for purposes of intensification. The writer intentionally overstates or exaggerates an idea so as to strengthen dramatically the reader's reaction. As in the case of the simile and the metaphor, hyperbole is used frequently in colloquial communication.

E. Litotes, generally considered to be the most difficult of figurative expression, involve deliberate understatement usually through negation. Through denial of the opposite attribute of a thing, indirect affirmation is given to its true characteristics.

F. Metonymy is the use of one word for another that it suggests, or the use of one aspect of a whole to represent the whole, or it may consist of designating one thing by the name of another with which it is usually associated.

The teacher may present each of the principal concepts and figures of speech through selecting illustrations from textbooks or current periodicals. The teacher and students may discuss the illustrations analytically, and their understanding may be reinforced by follow-up exercises.

Every effort should be made to provide for student participation in oral discourse, as well as written, in which figurative language is used. For example, the students may engage in oral descriptions of a classmate's attire in a way similar to that used in that old party game, "My Grandmother's Trunk." In place of nouns added to things to be packed, analogous comparisons could be used to extend a simile or metaphor; for example, "Betty's sweater is blood red, fiery red, cherry red, cardinal red, tomato red, etc." In written exercises, students could be encouraged to develop (or select from sources) examples of figurative language for members of the class to categorize. The following phrases are illustrative: as quick as lightning, tired to death, the universal power of the pen, as smooth as silk, and an army of 500 rifles.

There is no reason, also, why students could not develop a composite collection of local and regional figurative usage and combine it into a thesaurus of figures of speech. It is possible that through this procedure, those previously mentioned, and similar practices that the teacher may guide awareness of the universality of nonliteral language and its practical applications. The end product would contribute to the acquisition of an indispensable critical reading skill.

Concluding Statement

The secondary school today must accept responsibility for fostering the higher-literacy abilities of the student. By building upon (or compensating for) the reading skills which should have been developed in the preceding grades, mastery of the abilities to analyze, interpret, and judge abstruse rhetoric should be a regular part of the instructional program on this educational level. Not only does academic success depend upon critical reading proficiency but our national welfare demands a citizenry capable of purposeful, thoughtful, interpretation of the ideas of others.

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Study Skills for Secondary Students

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WHY IS THERE A CONCERN about study skills for high school students? Is it because the study skills have been neglected or badly taught in the elementary school reading program? Is it because there is a real need for continuing study skills instruction with progressively difficult materials? Is it because these students fail to demonstrate proficiency in independent study? Perhaps the answer is "some of each."

But there is not much doubt about the relationship between performance on specific study skills and the mastery of information through reading. Teachers are all too aware of high school students who are doing badly in their subjects. College instructors who seem less sympathetic to student weaknesses than their high school counterparts are having to face similar problems. Failures cannot be explained by single factors, but one contributor is the student's inability to cope with the increasing reading demands that are made of him. Greater dependence upon independent activity is certainly characteristic of higher education. Students who are able to read efficiently, and a major portion of their time is spent in reading, possess the tools to complete their tasks. The study skills help to make up part of this tool kit. Confirmation of this condition can be found in the results of studies which have sought to identify relationships between reading skills and selected achievement areas and the adequacy of study techniques and its relation to school performance.

Scope of Study Skills

In order for high school and college students to acquire information through their own efforts, they must learn to provide the self-direction necessary to the successful completion of independent activities. They must learn efficient ways of pursuing their objectives once they have established them. They must learn to be selective as they receive quantities of information while separating ideas and retaining those which are needed to complete the tasks. Students must learn to make decisions, to test alternatives, and to reconstruct ideas. In addition to using the skills of word recognition, comprehension, interpretation, and critical evaluation—skills which apply to all kinds of reading—students who engage in study activities must be proficient in sets of skills that have particular relevancy to study-type activities. We call these sets the "study skills."

An examination of the literature on reading will reveal lack of agreement on what skills to include. Perhaps the recognition of the relationship between generalized reading skills and specialized study skills accounts for some of the confusion surrounding each. Unquestionably, students who engage in independent study must understand and react to what they read: recognize words and their meanings; grasp literal ideas and draw inferences; and accept, reject and/or withhold judgment. In addition, they have to locate, select, organize, and retain information; understand graphic representations; follow directions; and adjust reading modes to purposes and materials. It is with these latter requirements that the study skills are involved.

It may be helpful to be more specific: to *locate* information and its sources through use of the tables of contents, indexes, library card, catalogs, encyclopedias, almanacs, appendixes, and reader's guides; to *select* information by recognizing its significance, important ideas, and details; to *organize* and *remember* information through note taking, summarizing, outlining, and following organizational patterns; to *understand* the *significance of graphic aids* by reading and interpreting diagrams, charts, tables, maps, graphs, cartoons, and pictures; to *follow directions,* both simple and complex, and to see relationships between them and learners' purposes; and to *develop reading flexibility* that is characterized by slow, careful reading and rereading, rapid reading, skimming, and scanning.

Each of these requirements is not necessarily discrete; in fact, many are related and form a hierarchy. For example, organization depends upon selection; and selection, upon flexibility and location of information. A failure in one adversely influences the performance in another. But recognition of this interdependence does not suggest that the requirements be treated in a global way; it is the perception of relationships that these associations elicit.

Strategies for Teaching

Time and space restrictions do not allow for a detailed representation of how to help students upgrade their proficiency in using the study skills to acquire information. Perhaps what can be done is to identify guidelines that teachers may follow and from which they might draw their teaching strategies. Certainly there have been many helpful suggestions offered teachers who strive to assist their students in mastering the content of the subject. But one is completely dependent upon the guidelines unless he understands the base from which they are derived. Creative teaching will offer other outlets that lockstep approaches cannot match.

1. *Use the textbooks and other materials students are required to read* to help them with their study skills. This procedure obviates any concern about transfer of learning that often fails to occur when students work with materials which have little relationship to kinds they are required to read. There are some commercial materials that reproduce varied textbook sections, and these may be used for initial presentations especially when content area teachers feel somewhat insecure about undertaking a new responsibility. Ultimately, students need to practice a given skill under the same conditions that are present when work is done independently. Discriminating teachers will be able to identify helpful procedures in commercial sources and extend them to the students' own materials. For example, exercises on skimming a chapter of a book for general impression can be applied to a student's own books after he has developed some proficiency in performing the skill.

2. *Concentrate upon study skills which help students solve current problems.* There certainly isn't so much justification for expending one's efforts to master tasks that are of little immediate use as there is on others whose relevancy is apparent. Even if college students were not questioning traditional treatments (and high school students are following suit), it would be desirable to take advantage of their motives for learning—in this case the need to solve a real problem—and stress elements that relate to it. What

better opportunity does one have to teach the techniques involved in preparing written reports based upon information that must be drawn from several sources than when students understand their purposes and clamor for assistance? Learning climates such as this foster active, instead of passive, participation. Incidentally, superior results might be expected from similar treatments whenever any skill development is the objective.

3. *Determine before instruction in which skills areas and their components students are strong and/or weak.* The importance of evaluating study skills has been stressed in a recent IRA publication intended for secondary school teachers of content subjects (*1*). It isn't likely that all students in secondary school are equally deficient in the study skills; nor is it likely that everyone requires the same concentration of effort. The intent here is to offer relevant guidance in lieu of "shotgun" instruction. One group of students might require a light treatment or no treatment at all in differentiating between major and secondary details while another might profit from heavy doses of help and practice.

How might this evaluation be made?—through the use of standardized tests, teacher-made tests, observations of how students perform, and discussions with students themselves. Observers have noted the limitations of standardized tests although they do provide some information, however gross, about students' performances. The latter devices, when used in combination, yield a more accurate analysis of behavior. Naturally, the quality of one's own instruments and observations determines the validity and reliability of the results they produce.

A brief word about the last device. Students can and do have some insights into their own hangups which they verbalize for sympathetic listeners. They will respond to probing questions about the ways in which they face reading assignments and how well they perform. Take advantage of a primary source: get it from the performers themselves. Tests and observations can confirm and refine where necessary.

4. *Select materials whose content does not offer too great a challenge.* Interference with learning will occur if students have to struggle with the content in order to understand it. Under such con-

ditions they will expend all their energies trying to cope with meaning and will have nothing left for their immediate purposes. Suitable learning climates are particularly crucial at initial stages of development; once students have shown some proficiency they can be challenged. Imagine trying to learn how to take meaningful notes of content whose vocabulary, concepts, and sentence structure are beyond the readers' scope. There is no reason why this failure should be courted. One way to reduce such possibilities is to introduce materials which have been read for other purposes. Another is to analyze the content for difficulties and treat them before proceeding with the skill development.

5. *Develop a hierarchy of skills and teach them in sequence.* This principle serves as a major underpinning in the development of programed materials, and their advocates credit, along with immediate reinforcement, the successes that have been achieved through them. In order to develop some sequence, a basic question might be asked: Of what smaller skills does a gross skill consist? Once the former have been identified, then it becomes feasible to place them in some order. Another question to promote sequence is asked: Upon what skill or skills does the mastery of another skill depend? The answer to this question will help determine sequence. Incidentally, it will also contribute to readiness.

A couple of examples should clarify these notions. In order to use an index of a book efficiently, a reader must first be able to "enter" the index. Entry involves topic determination which can create problems of its own in cases where alternates must be considered, then location of topics and subtopics through knowledge of alphabetization, interpretation of symbols that identify page references, and skimming and/or scanning for information sought. Here are a number of tasks, any one of which might be analyzed further for components.

The separation of important ideas from lesser ones is a basic study skill. A main idea may be stated clearly at the very beginning of a passage; or it may be hidden among other information; or it may be necessary to combine ideas to formulate it; or it may have to be inferred. For students who need help with main ideas, what order of treatment should be followed to facilitate mastery? Should one deal with inferred ideas before treating explicitly stated ones? Hardly. A reasonable sequence might follow an order in which one proceeds from the obvious to the less apparent.

Analyses of skills provide teachers with direction. Analyses also can be put to another use. Earlier, note was taken of the importance of evaluation that preceded instruction. Recognition of hierarchy among skills can be translated into a series of subtests which identify strengths and/or weaknesses along the continuum. Thus, one's efforts need not be dissipated in covering familiar ground but concentrated upon areas that subtests have identified as requiring some attention.

Implementation of Program

For too long there have been discussions and debates over the role of high school teachers vis-à-vis reading improvement. In spite of the fact that there are convincing reasons why these teachers should join with others in a common effort, very meager progress indeed has been observed. When systems have shared dynamic leadership among subject teachers, supervisors, and administrators, results have occurred. But there are two few schools that attack the study skills problem in the place it will do the most good—right in the content area classes. And hardly a dent is being made at higher levels; although with the burgeoning growth of college populations, assumption of responsibility for helping students read better is not uncommon. Unfortunately, most reading study skills programs are separate from normal reading requirements.

Is there any way to achieve a partial breakthrough? Possibly. Content area teachers have been urged to become familiar with reading skills and their disposition, but failure is more apparent than success. What about turning the tables by having the reading teacher accept subject involvement? Most high school reading teachers are certified in a subject discipline but not in reading. If insecure, they could limit their efforts to their own areas. Thus students might receive study skills instruction in a given subject tied to current demands. Some reading teachers who had a working knowledge of more than one subject might expand their concentrations. Ideally, this program would occur in the regular subject classes. Reading and subject teachers could plan and work together. If a project of this sort were not realistic, then students would be programed for study skills work on a subject basis. Underlying this effort is the assumption that reading personnel is available. If none was, then sincere efforts to train willing subject teachers to undertake the responsibility would be made. College staffs could operate in much the same ways. Hopefully, there might come a time when subject teachers would gain sufficient confidence to take over, if only in part, by extending what reading teachers have initiated.

In summary, the time for implementing "paper" programs in study skills is long past due. There can be variations that peculiar circumstances dictate. But in the final analysis, what students get out of any program is what they and their mentors put into it. There is no reason why expenditures of effort by teachers cannot count more than they have. The students are bound to show the effects of vigorous and relevant reading instruction.

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Enriching Vocabulary in the Secondary Schools

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IN THE AUTUMN 1968 issue of *Electronic Age,* Long (*14*) noted that "More new English words have come into being during the last 50 years than in the 900 years preceding the twentieth century." Without contesting the accuracy of this statement, there is no disregarding the influence of the age of the computer and space science upon our vocabulary. Those who have followed the lunar orbits of the Apollos, must have been aware of the new vocabulary (*astronaut, module, oxidyzer, drogue chutes*) and the new meanings attached to old words and word combinations (*countdown, feedback, burn, splashdown*). These new words and new meanings for old words dramatize one of the most effective means of improving vocabulary, providing direct or vicarious associations with the major news events of our day. While there are many roads to vocabulary improvement, this paper concerns itself with three major approaches: 1) encouragement of recreational and supplementary reading; 2) use of the content areas to enrich vocabulary; and 3) systematic teaching of vocabulary, stressing specific techniques, devices, and materials.

Before listing specific methods or techniques, it is important that certain basic principles be stated. An understanding and application of these principles will, it is hoped, ensure a more effective and meaningful program of vocabulary development.

Guiding principles

1. Vocabulary development must be recognized as a vital activity that permeates the entire school program. It is not some esoteric exercise that is the sole province of the English teacher. In fact, the content areas are probably the most fertile grounds for vocabulary development. Thus, it is important that content area teachers be provided with ideas and techniques that will aid in vocabulary development.

2. The teacher's attitude and interest in vocabulary improvement are crucial factors. His own vocabulary must be a superior one; and his interest in words, language usage, and semantics must be self-evident. A teacher's enthusiasm for language is generally contagious; and when time and effort are concentrated on this important area, chances for progress are greatly improved.

3. Teachers must be aware of the problem of verbalism and do all they can to combat it. McKee (*15*) has defined verbalism in this manner: "It is quite possible for a person to recognize the form of a printed word or group of words as a symbol that he has seen before and to think, speak, or write the pronunciation for which that symbol stands without understanding clearly and correctly what the symbol means in the setting in which it is used. This practice, called verbalism, is rampant in our schools at most educational levels and in most fields of learning."

4. Pupils must be encouraged to develop "semantic sensitivity," i.e., a word has more than one meaning and that meanings vary with context. Harris (*10*), the nationally-syndicated columnist, labeled one of his daily columns "Antics With Semantics." He included such items as

> I have "imagination;" you are a "dreamer;" he is a "wild visionary."
>
> My plan is a "concept;" your plan is a "scheme;" his plan is a "vague outline."
>
> I am "optimistic;" you are "starry-eyed;" he is "gullible."
>
> I am "exercising my responsibility;" you are "asserting your authority;" he is "pulling rank."

Think of a class bulletin board titled "Antics With Semantics" containing examples taken from newspapers and magazines, as well as original items contributed by students.

Another illustration to point out the importance of semantic sensitivity is a letter written by an Englishman to a friend explaining his confusion with American word usage, particularly the word *fix*. He wrote:

> I am invited to dinner and my host asks how I would like a drink *fixed*. He means *mixed*. My hostess calls us to hurry because *dinner is*

all fixed—and she means *prepared.* My host says he must *get a flat tire fixed*—and he means *repaired.*

You say you are on a *fixed income.* You mean *steady and unchanged.* You say you will *fix something to the wall*—you mean *attach.* And you say you'll *fix him*—and you mean *get revenge.*

Finally you remark that you are in "a hell of a fix," and I see that you may have some comprehension of my predicament in trying to follow your simplification.

Encouraging recreational and supplementary reading

According to Strang, McCullough, and Traxler (*23*), "The most important means of vocabulary development is wide reading. This is at once the most painless and the most rewarding way of building one's vocabulary. In wide reading the student not only meets many new words in different fields but also becomes familiar with their different meanings in a variety of contexts."

There is no substitute for wide reading to improve vocabulary. Any method or technique that is effective in motivating recreational and supplementary reading is a good one. But the key question remains: How does one motivate wide reading, particularly in the case of the retarded and/or reluctant reader? Here are some suggestions:

1. Take a closer look at the interests of the student. What (in today's jargon) *turns him on*? Since motivation is a basic factor in attracting a reluctant reader to the printed page, it is important to know *why* and *what* he wants to read. Observe him carefully in and outside the classroom. Notice the topics he discusses or writes about when given freedom of choice. Where possible, make use of checklists and interest inventories.

2. Once you have some indication of his interests, where can you find the "right" book to match these interests? Whether reluctant readers prefer the "how-to-do-it" type of book or stories about heroes, sports, science fiction, or war adventures, it is part of the teacher's job to know sources of information that will enable him to match the right book with the right pupil at the key psychological moment. Teachers should become familiar with such helpful guides as *Good Books for Poor Readers* (*22*), *Reading Ladders for Human Relations* (*4*), *Gateways to Readable Books* (*24*), *Bulletin of the Cen-*

ter for Children's Books (*3*), *Fare for the Reluctant Reader* (*5*), *Books About Negro Life for Children* (*2*), and *A Place to Start* (*1*).

3. Make sure books are available. Concentrate on developing an attractive classroom library with coordinated book displays. Provide an atmosphere, both physical and psychological, that is conducive to wide reading. Whether you use the hard-sell or soft-sell approach, the important thing is that you do sell books to the student. We cannot rely upon some magic within the book itself to do the job for us.

4. Content area teachers must motivate recreational reading. It has been the writer's experience that secondary students are more impressed and apt to go along with the suggestions made by a math or science teacher than by the English teacher. Somehow students expect the English teacher to recommend books. That's his job. But when the math or science teacher recommends a novel or biography, then there must be some realistic and practical basis for it.

Use of the Content Areas to Enrich Vocabulary

Most educators will agree that reading skills are not transferred automatically from a corrective or remedial reading group to a social studies or science class. This transfer of learning, much to our regret, does not occur particularly when the new learning situation requires a different approach or a drastic reorganization of the original learning pattern. Robinson (*20*) emphasizes, "If the skill is to be retained and used, it is best introduced and taught in a situation where it is immediately needed." The same principle applies equally well to vocabulary development. Each subject area has its own specialized vocabulary and basic concepts that are particularly its own.

The author recently looked through a catalog of courses offered by Systems Research Institute of International Business Machines (*25*). Under "Topics Covered" for the course, "Time-Sharing Systems: Concepts," was the following terminology: "Functional requirements (performance reliability and security, marketing considerations), equipment (terminals, multiplexor, processors, storage); special processor functions (dynamic allocation, relocation, protection); programing (supervisor, schedules, command and programing languages, compilers); comparative discussion of other systems (MAC, SDC, JOSS, QUIKTRAN, BASIC) and equipment (GE 645, SDS 940, and Sigma 7)." Can you imagine the amount of readiness needed by the average English major for this course? Hildreth (*11*) has provided some interesting examples of difficult concepts from fourth and fifth grade geography, science, and arithmetic books. Teachers found that many pupils did not understand these concepts even after the material had been assigned and covered in class. Secondary school teachers usually find an even greater density of difficult concepts.

> Many years and great sums of money will be needed to *harness the river.*
>
> When you are frightened, your *pupils get bigger.*
>
> You bite and chew your food with the *crowns of your teeth.*
>
> Birds help to keep the *balance of nature.*
>
> The native city is *backward* and ugly.
>
> The Mediterranean became a *melting pot* for surrounding civilization.
>
> The people who lived in *fixed settlements* made far greater progress than the Nomads.
>
> Science has *unlocked the greatest force in nature.*
>
> The *shrinking world* and new inventions have made this possible.
>
> Another "jewel" had *been added to the British crown.*
>
> *Check* by doing each example again.

For decades, teachers in the elementary grades have been using one form or another of a directed reading activity to improve vocabulary, as well as comprehension skills. Generally speaking, this approach has five interrelated components: 1) readiness for the lesson, 2) guided silent reading, 3) discussion with special emphasis on the comprehension skills, 4) oral and/or silent rereading for critical evaluation and a further check on comprehension skills, and 5) follow up and enrichment of the lesson, at times involving application to other areas. Content area teachers in the secondary school can use this procedure, particularly the readiness component, as a method of vocabulary improvement. The discussion of a few key words or concepts used in the assignment, relating new meanings to old and familiar experiences, supplying concrete and colorful illustrations to bring the word or concept to life—all are an important part of the vocabulary building process.

In an article devoted to increasing reading power in social studies, Jenkinson (*12*) presents three areas of word knowledge which reading teachers and content area teachers should be emphasizing:

1. *Function words*—these so-called coordinators or connectives separated by themselves have little meaning but in context often carry the major burden of precise meaning.
   a. Cause and effect—because, since, so that
   b. Those which suggest condition—if, unless, although
   c. Those that indicate contrast—whereas, while
   d. Those that state time relationships—as, before, when, after, during, while, etc.
   e. Those which introduce parallel ideas—however, therefore, nevertheless, hence, accordingly, similarly, on the other hand, in conclusion, etc.
2. *Shifts in meaning*—the use of familiar words in unfamiliar context and the metaphorical implication of terms.
   a. Cabinet as furniture or political organization; minister as clergyman or political rank
   b. Iron curtain, cold war, tariff wall
3. *Classifying word meanings*—a way of aiding thinking through language.
   a. Comparing similarities and differences (declaration and proclamation)
   b. Contrasting differences (democracy and republic)
   c. Paired qualities (humid and dank, kind and gentle)

Finally, the art of questioning should be considered not only as a tool for improving comprehension but as a means for checking and reinforcing word meanings. The writer recalls a seventh grader reading orally the following sentence: "The American colonists decided to boycott all English goods." When asked the meaning of "boycott," the student replied "A boycott is an effective weapon." When asked to comment further, he added, "A boycott is an axe or a rifle." Obviously, the student had recalled his teacher's saying that a boycott was an "effective weapon," and he associated only one type of meaning with "weapon." His original reply to "boycott" was a good illustration of verbalism described earlier.

Suggested Activities for Vocabulary Improvement

1. Make sure students are aware of other helpful language books, in addition to a good dictionary. Prepare lessons and exercises based on such texts as Soule's *Dictionary of English Synonyms* (*21*), Fernald's *Handbook of Synonyms, Antonyms, and Prepositions* (*6*), Roget's *Thesaurus* (*16*), Perrin's *Writer's Guide and Index to English* (*18*), Fowler's *Modern English Usage* (*7*), and Partridge's *Origins: The Encyclopedia of Words* (*17*).

2. Take some of the key or directive words used frequently in essay examinations or in questions at the end of a chapter and provide specific illustrations as to their correct use. Clarify and illustrate the distinctions among such key words as enumerate, evaluate, contrast, compare, define, justify, summarize, criticize, outline, trace.

3. Rewrite newspaper headlines using more vivid or colorful words. Show how meanings can be slanted or distorted by the use of certain emotion-arousing words. The same thing may be done with paragraphs by using substitutes for overworked adjectives and verbs.

4. Take well-known proverbs and quotations and express them in other terms. See how Rauch and Weinstein use this type of exercise in their text *Mastering Reading Skills* (*19*).

5. Use magazine covers and other illustrations or photographs and have students supply the one best word that characterizes the situation, event, or person depicted. Following this assignment, have students supply antonyms to express the reverse or opposite meaning intended.

6. Prepare lists of idiomatic phrases or picturesque expressions followed by a choice of meanings. Note the following technique used by Gilbert (*8*) in *Breaking the Reading Barrier:*

"toe the mark"
a. raise objections
b. obey the rules
c. be courteous to the leader
d. go to work on time

"run-of-the-mill" speech
a. a talk to factory workers
b. a powerful talk
c. a boring talk
d. a not-unusual talk

7. Try a different approach to the study of prefixes, roots, and suffixes. Note the following technique used by Gilbert (*9*) in *Power and Speed in Reading:*

> "Directions: Read the definition at the left, then study the roots at the right. Finally fill in the blank.
> a. implied, but not clearly stated im (in) + L. plicare (fold)
> The adjective is *(implicit)*
> b. definite, distinctly stated ex (out) + L. plicare (fold)
> The adjective is *(explicit)*
> c. dispute, argument contro (against) + versus (turned)
> The noun is *(controversy)*"

8. Select any prominent personality in politics, science, art, sports, or show business and list as many words as possible that might be used to give an accurate picture of this person. For example, take a current villain and supply such words as contemptible, odious, vulgar, despicable, base, opprobrious, and contumelious.

9. Consider the various ways in which context may be used to help determine the meaning of a word.

10. Instill pride in the collection of new words. Have students prepare personal files or notebooks organized under the headings of the major academic disciplines, i.e., the arts, social sciences, physical sciences, literature and mathematics. One of the most helpful vocabulary texts ever prepared (in the writer's opinion), Norman Lewis' *Word Power Made Easy* (*13*), uses a classification approach.

Recommended Texts and Workbooks for Vocabulary Development

Brown, James I. *Programed Vocabulary.* New York: Appleton-Century-Crofts, 1964.

DeVitis, A. A., and J. R. Warner. *Words in Context: A Vocabulary Builder* (2nd ed.). New York: Appleton-Century-Crofts, 1967.

Funk, Wilfred, and Norman Lewis. *30 Days to a More Powerful Vocabulary*. New York: Pocket Books, 1954.

Gilmartin, John G. *Building Your Vocabulary* (rev. ed.). Englewood Cliffs, N.J.: Prentice-Hall, 1950.

Goodman, Roger B., and David Lewin. *New Ways to Greater Word Power*. New York: Dell, 1955.

Lewis, Norman. *Word Power Made Easy*. New York: Pocket Books, 1953.

Norwood, James E. *Concerning Words*. New York: Prentice-Hall, 1950.

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Shostak, Jerome. *Concise Dictionary of Current American Usage*. New York: Washington Square Press, 1968.

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2. Baker, Augusta (Ed.). *Books About Negro Life for Children*. New York: New York Public Library, 1965.
3. *Bulletin of the Center for Children's Books* (published monthly). Chicago: University of Chicago Press.
4. Crosby, Muriel (Ed). *Reading Ladders for Human Relations* (4th ed.). Washington, D.C.: American Council on Education, 1964.
5. Dunne, Anita E., Mabel E. Jackman, and J. Roy Newton. *Fare for the Reluctant Reader* (3rd ed.). Albany, New York: Capital Area School Development Association, State University of New York at Albany, 1964.
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7. Fowler, H. W. *Dictionary of Modern English Usage* (2nd ed., revised and edited by Ernest Gowers). New York: Oxford University Press, 1965.
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12. Jenkinson, Marion D. "Increasing Reading Power in Social Studies," in H. Alan Robinson and Sidney J. Rauch (Eds.), *Corrective Reading in the High School Classroom,* Perspectives in Reading No. 6. Newark, Del.: International Reading Association, 1966, 75-80.
13. Lewis, Norman. *Word Power Made Easy*. New York: Pocket Books, 1953.
14. Long, Thomas H. "Technology and its Effect on Language," *Electronic Age,* Autumn 1968. New York: Radio Corporation of America, 1968, 9.
15. McKee, Paul. *The Teaching of Reading in the Elementary School.* Boston: Houghton-Mifflin, 1948, 56.
16. Morehead, Albert H. (Ed.). *New American Roget's College Thesaurus in Dictionary Form*. New York: New American Library, 1962.
17. Partridge, Eric. *Origins: The Encyclopedia of Words.* New York: Macmillan, 1958.
18. Perrin, Porter A. *Writer's Guide and Index to English* (4th ed.). Chicago: Scott, Foresman, 1965.
19. Rauch, Sidney J., and Alfred B. Weinstein. *Mastering Reading Skills.* New York: American, 1968.
20. Robinson, H. Alan. "Corrective Reading in the High School Classroom: Some Principles and Procedures," in H. Alan Robinson and Sidney J. Rauch (Eds.), *Corrective Reading in the High School Classroom,* Perspectives in Reading No. 6. Newark, Del.: International Reading Association, 1966, 12.
21. Soule, Richard. *Dictionary of English Synonyms.* New York: Bantam Books, 1960.
22. Spache, George D. *Good Books for Poor Readers* (rev. ed.). Champaign, Ill.: Garrard, 1968.
23. Strang, Ruth, Constance M. McCullough, and Arthur E. Traxler. *The Improvement of Reading* (4th ed.). New York: McGraw-Hill, 1967, 241.
24. Strang, Ruth, Ethylene Phelps, and Dorothy Withrow. *Gateways to Readable Books.* New York: H. W. Wilson, 1966.
25. Systems Research Institute. *News and Notes.* New York: International Business Machines, January 1969.

APPENDIX A

Sandy's 99 Sports Books for Reluctant Readers

Selected by **COACH SANFORD PATLAK**
University of Chicago Laboratory Schools

COACH SANDY PATLAK has found that the books in this list often spark interest in reading among reluctant readers. "While a troubled reader often shies away from reading subjects," comments Coach Patlak, "in sports his attitude is often right. I try to capitalize on a lively interest—make readers of students no one else can reach."

Sandy's selected book list includes sound "how-to-do-it" books in sports as well as fast-moving, action-filled fiction. According to Coach Patlak, the books are of high interest to junior high and high school students, while the reading difficulty of most of the books is at upper-grade or junior high level. The coach's own professional books are available to meet the needs of readers who should be challenged by more difficult reading-matter.

AUTO RACING

Title	*Author*	*Publisher*
Dragging & Driving	MacPherson	Scholastic Book Services
Great Auto Race, The	Carlson, R. & G.	" " "

BASEBALL

A Pennant for the Kremlin	Molloy	Doubleday
Amazing Mets, The	Mitchell	Grosset & Dunlap
Babe Ruth Story, The	Ruth	Scholastic Book Services
Baseball	Toporcer	" " "
Baseball is a Funny Game	Garagiola	Bantam
Baseball Laughs	Masin	Scholastic Book Services
Baseball Spark Plug	Zanger	Doubleday
Baseball Stars of '66	Robinson	Pyramid
Baseball Stories	Owen	Pocket Books
Baseball Wit & Wisdom	Graham & Hyman	Scholastic Book Services
Fence Busters	Bee	Grosset & Dunlap
Fighting Southpaw, The	Flood	Grosset & Dunlap
General Baseball Doubleday	Holzman	Longmans, Green & Co.
Greatest in Baseball, The	Davis	Scholastic Book Services

BASEBALL (*Continued*)

Title	*Author*	*Publisher*
Highpockets	Tunis	Scholastic Book Services
Hillbilly Pitcher	Jackson	" " "
How to Star in Baseball	Masin	" " "
Junk Pitcher	Knott	Follett
Kid Comes Back, The	Tunis	Scholastic Book Services
Kid Who Batted 1,000, The	Allisor-Hill	" " "
Little League Victory	Bishop	Lippincott
My Greatest Day in Baseball	Carmichel	Grosset & Dunlap
Nine Make a Team	Neigoff	Albert Whitman
1964 Major League Baseball Handbook	Anderson	J. Lowell Pratt
Outfield Orphan	Archibald	Macrae, Smith
Real Book About Baseball, The	Hopkins	Garden City Books
Red-Headed Outfield, The & Other Baseball Stories	Grey	Grosset & Dunlap
Relief Pitcher	Friendlich	Westminster
Schoolboy Johnson	Tunis	Berkley
Stan Musial	Broeg	Doubleday
Stan Musial	Robinson	Putnam
Steady	Renicks	Scribner
Strike Three	Bee	Grosset & Dunlap
Today's Game	Quigley	Viking
Treasure at First Base	Clymer	Scholastic Book Services
Winning Pitcher	Porter	Grosset & Dunlap
Wonder Boy	Heuman	Scholastic Book Services
World Series	Tunis	Berkley
Yogi Berra	Trimble	Grosset & Dunlap

BASKETBALL

Backcourt Atom	Olgin, Joseph	Houghton Miffln
Basketball Case Book, 1966-67		The N.F.S.H.S.A.A.*
Basketball for Boys	Orsborn	Follett
Basketball Player Handbook, 1964-65 & 1965-66		The N.F.S.H.S.A.A.
Basketball Rules, 1965-66		"
Basketball Rules, 1968-69		"
Basketball Stars of '68	Stainback	Pyramid
Break for the Basket	Christopher	Scholastic Book Services
Buzzer Basket	Bee, Clair	Grosset & Dunlap
Champion of the Court	Verral	Scholastic Book Services
Coach Nobody Liked, The	Carson	Farrar, Strais & Giroux
Go Team, Go	Tunis, John	Scholastic Book Services

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* National Federation of State High School Athletic Association.

BASKETBALL (*Continued*)

Title	*Author*	*Publisher*
Hoop Crazy	Bee	Grosset & Dunlap
How to Star in Basketball	Masin	Scholastic Book Services
So You Want to Play High School Basketball	Pink, Charles	Rand McNally
Wilt Chamberlain	Sullivan	Grosset & Dunlap

BOATING

Power and Sail	Lydgate	Scholastic Book Services

BOWLING

Strike!	Clause & McBride	Scholastic Book Services
Young Sportsman's Guide to Bowling	Weber & White	Nelson

BOXING

How to Judge Boxing	Gilmer, Frank	R. R. Donnelley

DIVING

Pearl Lagoon, The	Nordhoff, Charles	Scholastic Book Services
Skin Diving	Dresner, Sim	Rand McNally

FIRST AID—ANATOMY

American Red Cross First Aid Textbook		Blakiston
Athletic Injuries		Denver Chem. Mfg.
First Aid		Doubleday
How Your Body Works	Schneider, J.	Young Scott
Wonders of the Human Body	Ravielli	Scholastic Book Services

FOOTBALL

Bertie Comes Through	Felsen	Scholastic Book Services
Fighting Blood	Weliger	Goldsmith
Fighting Coach	Jackson & Schulz	Sandpiper
Football for Boys	Kuharich, Joe	Follett
Football Fury	Gelman	Doubleday
Great Teams of Pro Football	Smith	Dell

FOOTBALL (*Continued*)

Title	*Author*	*Publisher*
How to Star in Football	Masin	Scholastic Book Services
Kick-off	Fenner, P.	Knopf
Nicky's Football Team	Renick	Scribner
Pro Football Handbook	Anderson	J. Lowell Pratt
Pro Football's Hall of Fame	Daley	Scholastic Book Services
Pro Quarter Back	Tittle & Liss	" " "
They Pay Me to Catch Footballs	McDonald	" " "
Touchdown for Tommy	Christopher	" " "

HOCKEY

Slashing Blades	Porter	Grosset & Dunlap

MISCELLANEOUS

Encyclopedia of Sports, The	Menke, F. G.	Barnes
Great Sports Stories	Masin	Berkley
Here's Why: Science in Sports	Barr	Scholastic Book Services
Hit Parade of Sports Stories	Friendlich, D.	" " "
How to Improve Your Sports (Series)	Athletic Institute	Merchandise Mart
Outdoor Sports Stories	Furman	Grosset & Dunlap
Where Speed is King	Hyde, M. & E.	Whittlesey

SKIING—SOCCER

No Head for Soccer	Harkins, P.	Morrow
Skiing for Beginners	Brown, Conrad	Scribner

SWIMMING

Collegiate Swimming Guide, 1962		The N.C.A.B.
Life Saving & Water Safety	American Red Cross	Doubleday
Swimming & Water Safety	American Red Cross	American Red Cross

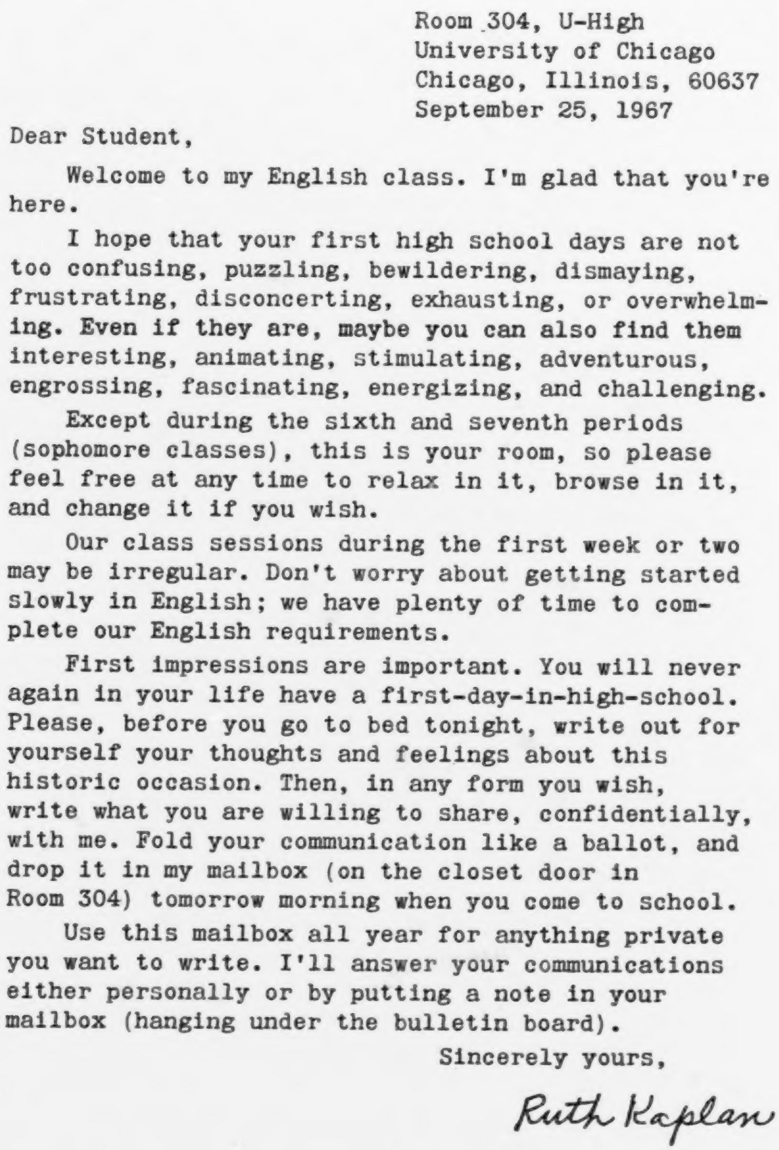
TENNIS

Tennis is My Racket	Riggs	Simon & Schuster

TRACK

Comeback Guy, The	Frick, C. H.	Harcourt, Brace & World
Duel on the Cinders	Porter	Grosset & Dunlap
How to Star in Track & Field	O'Connor	Scholastic Book Services

APPENDIX B



Room 304, U-High
University of Chicago
Chicago, Illinois, 60637
September 25, 1967

Dear Student,

Welcome to my English class. I'm glad that you're here.

I hope that your first high school days are not too confusing, puzzling, bewildering, dismaying, frustrating, disconcerting, exhausting, or overwhelming. Even if they are, maybe you can also find them interesting, animating, stimulating, adventurous, engrossing, fascinating, energizing, and challenging.

Except during the sixth and seventh periods (sophomore classes), this is your room, so please feel free at any time to relax in it, browse in it, and change it if you wish.

Our class sessions during the first week or two may be irregular. Don't worry about getting started slowly in English; we have plenty of time to complete our English requirements.

First impressions are important. You will never again in your life have a first-day-in-high-school. Please, before you go to bed tonight, write out for yourself your thoughts and feelings about this historic occasion. Then, in any form you wish, write what you are willing to share, confidentially, with me. Fold your communication like a ballot, and drop it in my mailbox (on the closet door in Room 304) tomorrow morning when you come to school.

Use this mailbox all year for anything private you want to write. I'll answer your communications either personally or by putting a note in your mailbox (hanging under the bulletin board).

Sincerely yours,

Ruth Kaplan

Literary Man: Writer and Reader

Sharon Feiman, Darlene Friedman, and James McCampbell
Materials Produced by Independent Learning Project, University High School
University of Chicago

The Independent Learning Project is funded by the State of Illinois,
under the Illinois Plan for Program Development for Gifted Children
1968

Introduction

This unit goes beyond the usual emphasis on the reader's responsibilities to include an investigation of the writer's responsibilities. The writer struggles to embody his experiences and concerns in a literary form. The reader responds to, and attempts to understand, the writer's created world. He sees the world through his own experience which in turn is colored by the work. The work is a construct from the writer's life—for the reader, a reflection of worlds he has known or an introduction to views of the world he can know. The reader and artifact writer are inseparably separated in artful understanding.

Although literature is many things, a view of literature as an involvement in significant concerns may better lead to the rapprochement of the adolescent and the literary world. From their interest in literature will grow their skill in literary analysis.

The student begins with his natural fascination for and involvement in his own life and his own concerns. If this involvement can find application in his work, it is more likely that he will learn. Experiences as a writer help the student recognize artful writing as a natural mode of human expression of real concerns. As others read his works, he becomes aware of the writer's experience. His role as a reader should help him recognize the reader's responsibilities to the artifact, to respond to concerns that are limited by its artful structure and form since the work, or artifact, must stand alone disassociated from the writer.

The purpose of this unit is to involve the students in an investigation of the relationships of writer, artifact, and reader. The more specific goals of the unit are:

1. Appreciation of writing as a natural mode of expression.

2. Recognition that the reader brings to a piece of writing associations that the writer cannot control.
3. Understanding of the role of thematic elements in literature.
4. Greater understanding of the control which the author exercises over his material.
5. Recognition of the relationship between the individual reader's concerns and the concerns common to literature.
6. Understanding that the artifact stands alone.

Steps of the Unit (Total Time: 6-8 Weeks)

First students are asked to write about a memorable incident. Since the concern in this initial step is not with writing but with the significance of an event, an atmosphere in which students will willingly share meaningful experiences must be created in the classroom. This experience can provide the raw material for a developed piece of writing subsequently.

The students then discuss the themes suggested by incidents they have recorded. From a class discussion of several incidents comes a series of questions to guide smaller group discussions of the remaining incidents. The following kinds of questions emerge from the students' discussion: Can an incident suggest multiple themes? Is a writer always conscious of the ideas implicit in his work? Does this awareness precede or follow the creative act? What kinds of evidence must a reader gather to substantiate his belief that an incident suggests a particular theme? Assuming that the students have written about an incident that touches them, their examples may suggest common themes. In a later lesson they will see that professional writers also have been concerned with many of the ideas which engage them. This congruence of concern suggests how literature helps man understand himself.

A writer can manipulate his material regarding a single event so as to suggest contrasting attitudes toward the same themes. To sensitize students to this kind of artistic control, small groups next take one of the incidents reported and propose ways to adjust it in order to produce conflicting statements on the same themes.

Next, students write a finished creative work. The facility with which the student can imply themes in his own writing and infer them from the work of others is then tested. In small groups the students read each other's writing. As a group they write a thematic analysis of the best work they have examined. The best creative writing accompanied by the group's thematic analysis and a reply by the author is published in a booklet. The critical essays serve as models for the final writing assignment.

Now students turn to literature. The examination of various literary forms and conflicting thematic statements helps them to articulate criteria for evaluating a literary work. Are particular themes most appropriately embodied in particular forms? Is the artistic success of a work and one's appreciation of it contingent upon an agreement with the author's attitude? To what extent is reading a discovery and development of the reader's ideas? To what extent is writing the exploration and development of the writer's ideas?

As the initial incident rose from student's own experiences, so the final assignment turns upon their concerns. They are asked to choose a concern and express feelings about that concern in any form. The consequent work is then displayed and critiqued. This unit concludes with individual student analysis of the learning that has resulted from the unit work.

In summary, the steps of the unit are:

1. Administration of the PRE-TEST provides a basis for making comparative judgments at the end of the unit (1 period).
2A. Students jot down an incident from their experience (10-20 minutes).
2B. Students analyze incidents to discover themes and begin to discuss major ideas of the unit (1-2 periods).
3. Student groups analyze incidents independent of teacher (1 period).
4. Students communicate themes through skits. They then discuss problems of artistic control (1-2 periods).
5. Students analyze "The Celestial Omnibus" by E. M. Forster as a basis for discussing the role of the reader (1-2 periods).
6. Students plan and execute a finished piece of creative writing (5-7 periods).
7. Students compare their original with their finished products as a basis for discussing the creative process, which discussion follows (1 period).
8. Students select the best student works and write critical reviews. The authors respond in writing to these reviews. Works, reviews, and responses are presented orally to the entire class (7 periods).
9. Students examine their experiences to determine the values of their activities (½-1 period).

10. Students discuss concerns important to them, select one, divide into groups to study the concern in different literary forms, and share their findings with the entire class (5-8 periods).
11. Students select concerns important to them and repeat the activities of steps 6, 7 and 8. This time they are free to use any medium for creation. Every student's work is reviewed, and every student writes a review (4-7 periods).
12. Students take the POST-TEST and evaluate (analyze) changes in their attitudes from the pre- to the post-test (2 periods).

Premises Underlying the Unit

The purpose of this unit of instruction is the same as nearly any unit of instruction in English—to create enthusiasm for reading and writing, and to improve students' skills. If it proves to be more effective than most such units of instruction, it is so because it approaches this goal from different premises about the nature of English, the nature of learning, and the nature of the task of teaching. The following explanation of these premises is certainly not meant as a rigorous philosophy but rather as a statement of the urgings which prompted the development of the unit.

In most English classrooms English is apparently the accumulation of a variety of language-arts skills to be presented to students for their mastery. Instead we would view English as individuals enthusiastic about reading and writing internalizing skills through their active involvement in these activities.

Even if the teacher has an image of an individual rather than an image of a group of skills, it is often unfortunately limited to that of the critical reader who learns by answering the analytical questions that the teacher has set for him. Instead we see the critical reader as one who has come to his critical abilities through his involvement in literature as an expression of human concerns significant to him as an individual.

If the English teacher has a model of literature it is often of a few selections to be appropriately worshipped from afar. Instead we see the written work as a product of human experience valid only as an expression of that experience whether written by the student, a classmate, or a great literary artist.

If the teacher has a model of the student as writer, it is often limited to correctness of expression in expository writing assigned by some teacher. Instead we see the writer as an individual attempting to express his own concerns in whatever form seems right for him, and attempting to improve his expression through experimentation with other techniques and forms.

If the English teacher has a view of the humane individual it is not apparent in the fragmentation of activities in the English classroom. We see the humane individual moving naturally and constantly from the role of writer to reader, from the role of reader to writer, at any level of sophistication, and in that movement beginning to appreciate the interrelationships of the two roles as necessary parts of the whole man. The writer struggles to embody his concerns in a literary form. The reader responds to the work; he attempts to understand the writer's created world. The writer-artifact-reader are inextricably bound in the task of artful understanding of the basic concerns of man. Although literature is many things, a view of literature as an involvement in significant concerns may better lead to the approachment of the adolescent and the literary world.

In other words this unit views the individual as growing in skill through his genuine involvement in both reading and writing as expressions of the concerns most significant to him.

Often teachers start with a list of skills for students to master and add motivational gimmicks to gain student interest. The starting point for development of curriculum should be the discovery of those activities which are intrinsically rewarding. If the student is involved in such activities, skill development will follow naturally. Therefore the unit begins with the student's natural fascination for and involvement in his own life and his own concerns.

In selecting particular materials for an entire class of students, teachers reach only those students whose level accidently matches those materials. Teachers should instead allow the students to find or to create materials that are right for them. In this unit students select their own professional literature which speaks to their own concerns at their own level. But even more important, the majority of the unit materials consists of writing created by the students themselves based on their concerns and experiences. Consequently students become actively involved in critical analysis because they are reading works written by peers.

The teacher's desire to encourage student development often leads to an overcritical reaction to materials or products which are relatively unsophisticated. Instead the teacher should accept the level of the student's work and be encouraged by students' willingness and eagerness to grow—however slow the pace, and whatever the starting point. The point of the unit is not the quality of the product but rather the acceptance of writing as a natural mode of expression. Once this happens the quality improves.

In developing materials to teach a particular skill curriculum designers arbitrarily limit possibilities of natural growth. If instead the curriculum is designed around intrinsically rewarding kinds of activities individuals in the classroom can grow in the variety of ways one would naturally expect. The activities of this unit are involved in critical reading and creative writing and allow the individual to grow in any of the skills in those areas.

In other words this unit of instruction is based on the premise that the teacher must accept the level of each individual, and help him find materials and activities which will allow him to develop not according to prescribed charts of skills and rates of growth but rather in the ways unique to him.

The views of English and learning expressed above obviously have implications for the role of the teacher. No longer can he select material, dictate standards of taste or tell students how to do things. No longer can he establish a neat order of questions to ask, answers to be given, ideas to be considered. Rather the teacher must carry in his head the whole framework of the unit. He creates the environment in which students operate on their own level of sophistication. He picks up clues from the students to reinforce all major goal questions. For example the first five steps offer a variety of situations from which students can gain insight into the nature of themes, writer-role, reader-role, the relationship of writer and reader, the independence of the artifact. Although it is predictable that by the end of these five steps students will have articulated insights into all these ideas, it is impossible to know at what particular point they will have a particular insight. Thus the activities can be considered appropriate since they accomplish their purpose; the teacher has the security of knowing that he can reach his goals. But he also has the rigorous demand of having to respond quickly and sensitively to student cues which may come at unpredictable times. What matters is that students have these insights; the order in which they occur is irrelevant.

Even if one activity is designed to focus on the writer, there can't be a writer without an artifact, there can't be a reader without, either. And since these other ideas are also part of the unit, the teacher must be able and willing to follow any of these issues as they are raised by the students, rather than locking the students to preconceived sequence.

Once the teacher sets the activity into motion, he steps aside and the students sustain them with their own enthusiasm and energy. Specifically they set their own standards as they respond to each other's writing. Consequently the teacher cannot set arbitrary standards of success but must watch the students as they show him what their standards are. Having watched he must be flexible enough to accept the variety of levels and variety of improvements that will develop from the students' interaction rather than from his directives.

Students no longer write a teacher-assigned paper to be read only by the teacher. They create real products which are expressions of their concerns and give them to a real audience of other concerned students. The teacher's purpose is to make quality products more likely by turning the students inward to their own experiences. He judges his success not by the form or subject matter or sophistication of the writing but by his effectiveness in allowing students to see writing as a natural expression of their concerns. When that happens the teacher has not been the cause of the writing by giving an assignment but rather has created an environment in which the students have the desire to discover and express what they have to say.

Just as the inspiration for writing comes from the students, the desire for and direction of growth will come from the student. And again the teacher must be open to the various demands of students and able to fulfill them, not by having a specific direction and pre-planned method but rather by relying on himself and other students as resources for support and growth.

Since life doesn't work according to due dates and since students are working on projects that are meaningful to them, they won't all follow a neat predictable schedule. Again the teacher must be open and flexible, willing to accept the dreamer with trust, the talker with restraint, the early finisher with suggestions, the late finisher with patience. Real people work in different ways at different paces and the teacher must accept that reality for it will result in enthusiasm and products which are real.

In other words the teacher must work diligently to structure situations. But within that environment, the classroom becomes a happening in which the teacher must respond not through staid plans but through his internal resources as a sensitive knowledgeable person. He must establish a delicate balance between structure and flexibility.

Professional Manuscript Readers

After a first reading of a manuscript, our ideal (composite) reader asks himself some of the following questions:

On Content
- What is the theme?
- What is the author's message?
- How is the theme communicated? (Literary genre)
- Do the content and form match?
- Is the literal meaning clear?
- Do the ideas come through clearly?
- Is the theme sufficiently developed?
- Are there contradictions in the content?
- Does it have a symbolic meaning? What is it?

On the author
- Is his writing creative?
- Does his writing seem inspired?
- Is he imaginative?
- Does he express himself freely and honestly?
- Was he enthusiastic or bored with his writing?
- What is his attitude toward his subject? (Did he have definite ideas to begin with, and not just write something for the reader to interpret?)
- Did he choose content worthy of his time and trouble?
- Is he original in his creating? (Theme or plot not over-used or stereotyped.)
- If he intended to be humorous, was he really funny?
- Did he over-do it?
- Is his writing believable?
- Is it realistic (plausible)?

On the writing
- Is it well written?
- Does it flow easily and smoothly?
- Is the writing too complicated?
- Is it repetitious?
- Does it stick to the point?
- Is it dragged out? Too wordy?
- Are the sentences wandering or hazy?

Are the sentences consistent? (not mixed intellectual and colloquial)
Are the word choices appropriate? (diction, vocabulary)
Is it marred with clichés?
Are the literary devices effective?
Does the writing fit the author's everyday self? (artificial, affected)

On the reading (if fiction)
Was it a good story?
Can the fantasy be accepted?
What is the author's point of view?
What is the atmosphere and mood of the story?
Can the reader see parts of himself in the characters? (similarities)
Are the characters developed deeply?
Do the characters seem real?
Are the descriptions vivid?
Is there sharp focus on the plot?
Are the plot and climax ingenious? (not easy to guess ahead)
Is there a climax with fresh twists?

On the effect produced on the reader
What is the effect?
Is it comfortable to read?
Is it interesting?
Is it enjoyable?
Does it involve the reader?
Is it hard to put down before finishing?
Can the reader identify with the writer or one of his characters?
What general impression does the reader get?
Does it make the reader think?
Does it "stay with you" for a long time?

APPENDIX C

Content Test–J-D

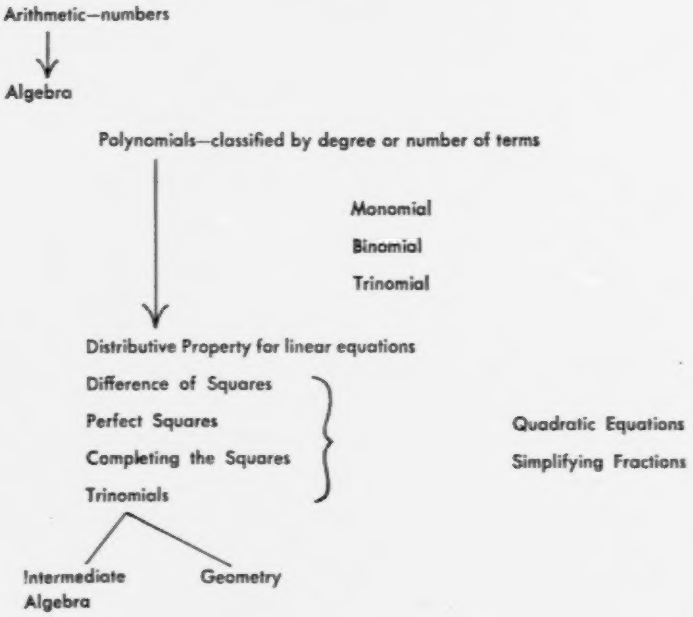
1. Factor over the integers:
   a) $9a^2 - 16$ a. ________________
   b) $x^2 - x - 20$ b. ________________
   c) $6x^2 - 11x - 72$ c. ________________
   d) $3ab - 3b^2 + 2a^2 - 2ab$ d. ________________
2. Find the truth sets of the following:
   a) $x^2 + 3x = 54$ a. ________________
   b) $y^2 + 56 = -154$ b. ________________
   c) $3a^2 + 8a = 3$ c. ________________
   d) $2x^2 = 13x - 6$ d. ________________
   e) $x^2 + 2 = 4x$ e. ________________
3. Fill in the missing terms so that the result is a perfect square
   a) $16s^2 + 85t +$ ________________
   b) $6^2 -$ (________________) $+ 25$
4. Find the remainder when $x^2 + 6x + 3$ is divided by $x + 2$ ________________
5. Express the fraction $\dfrac{x^2 - 7x - 12}{x^2 - 3x}$ ________________
6. When combined into a single fraction $\dfrac{3}{x+2} - \dfrac{2}{x-2}$ is equal to:
   a) $\dfrac{1}{x}$ b) $\dfrac{5}{x+2}$ c) $\dfrac{x-10}{x^2-4}$ d) $\dfrac{x-4}{x^2-4}$ ________________
7. When $\dfrac{x^2 - 9}{x}$ is divided by $\dfrac{x - 3,}{5x}$, the quotient is: ________________
   a) $\dfrac{(x-3)^2 (x+3)}{5x^2}$
   b) $5x (x + 3)$
   c) $5 (x + 3)$
   d) $5 (x - 3)$

Content Test–Tully

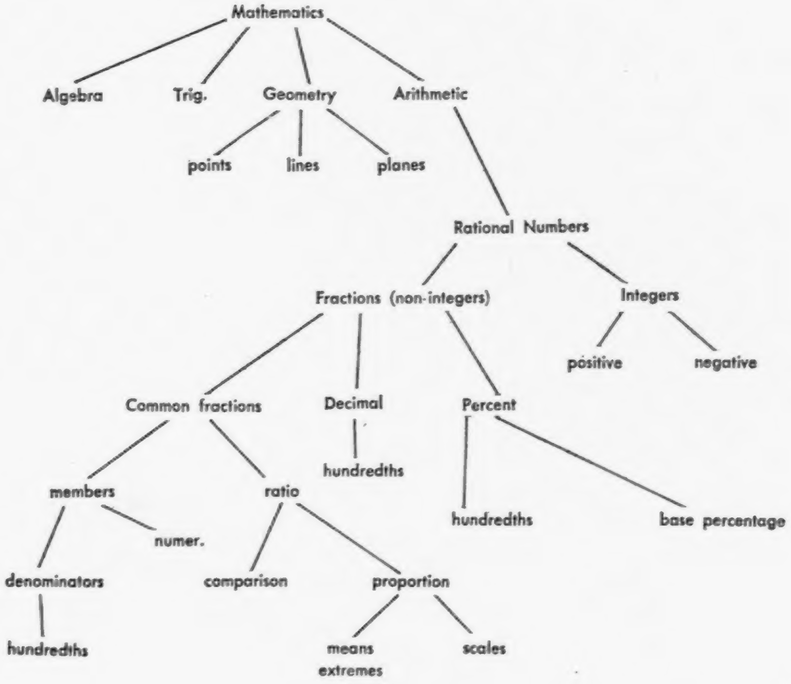
1. Write .125 as a per cent. ________________
2. Write 120% as a fraction reduced. ________________
3. Write ⅜ as a percent. ________________
4. Find a ratio of 4 ft. to 2yd. ________________
5. On a scale, if 1 in. = 6 ft., 2½ in. = ________________ ft.
6. The equivalent common fraction for 66 ⅔% is ________________.
7. The equivalent per cent for 4/3 is ________________.

8. Find 5% of $300. ____________________
9. 5 is what per cent of 200? ____________________
10. 30 is 75% of what number? ____________________
11. Find 20% less than 50. ____________________
12. Find 5% more than 200. ____________________
13. Complete the proportion $\frac{x}{30} = \frac{9}{10}$ ____________________.
14. 300% of $75.00 = ____________________.
15. Find the missing term in X : 3 = 6 : 18 ____________________.
16. An increase from $20.00 to $30.00 is what per cent increase? ____________________.
17. 40 is what per cent of 60. ____________________.
18. 40 is 25% of ____________________.
19. Write 5% as a decimal. ____________________
20. If 4 lemons cost $.25, how many can I buy for $1.25. ____________________

Structured Overview—J-D
FACTORING-CHANGING FORM—from Addition to Multiplication



Structured Overview—Tully



Relationships Test—J-D

Directions: Circle the letters which represent the *best* answers. You may circle more than one letter.

1. Factoring is important to what area(s) of mathematics?
   a. arithmetic
   b. algebra 9
   c. geometry
   d. intermediate algebra
   e. all of these

2. Factoring
   a. is using the distributive property
   b. is any change in form
   c. is a method of completing squares
   d. involves only changes in form
   e. none of these

3. Polynomial are classified
   a. by degree
   b. by operation
   c. by number of terms
   d. by factors
   e. all of these

4. Which of the following is a polynomial?
   a. monomial
   b. binomial
   c. trinomial
   d. perfect square
   e. all of these

5. Factoring is used to
   a. add minomials
   b. substract squares
   c. simplify factions
   d. solve equations
   e. none of these

6. Quadratic equations can be solved by:
   a. factoring
   b. substitution

c. completing the squares
d. using trinomials
e. all of these

7. The degree of a polynomial refers to the
   a. number of terms
   b. number of variables
   c. perfect squares
   d. factored form of polynomial
   e. none of these

8. Which of the following are expressions which tell the number of terms in a polynomial?
   a. monomial
   b. degree
   c. binomial
   d. squares
   e. all of these

9. The distributive property can be used to
   a. complete the squares
   b. solve quadratic equations
   c. solve linear equations
   d. simplify fractions
   e. all of these

10. Which of the following are types of factoring?
    a. associative property
    b. distributive property
    c. difference of squares
    d. binomials
    e. all of these

Relationships Test—Tully

1. Fractions are in the part of mathematics that we call
   a. algebra
   b. arithmetic
   c. geometry
   d. trigonometry
   e. none of these

2. Which of these always has 100 for a denominator?
   a. common fraction
   b. decimal
   c. per cent
   d. integer
   e. all of these

3. Which of these is the *opposite* of a fraction?
   a. common fraction
   b. decimal
   c. per cent
   d. integer
   e. none of these

4. A common fraction is also a
   a. integer
   b. proportion
   c. ratio
   d. decimal
   e. all of these

5. One hundred per cent is the same as what integer?
   a. 1.00
   b. 1
   c. .01
   d. 100.
   e. none of these

6. Which is the best description of rational numbers?
   a. integers and fractions
   b. ratios and proportions
   c. numerators and denominators
   d. decimals and per cent
   e. none of these

7. Which is the best description of ratio?
   a. a comparison
   b. a common fraction
   c. a non-integer
   d. a rational number
   e. all of these

8. Which is the best description of a fraction?
    a. a comparison
    b. a common fraction
    c. a non-integer
    d. a rational number
    e. all of these

9. A proportion is
    a. a comparison
    b. a common fraction
    c. a non-integer
    d. a rational number
    e. none of these

10. Which terms best describe proportion?
    a. base and percentage
    b. positive and negative
    c. means and extremes
    d. numerator and denominator
    e. none of these

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